

POPULAR HOUSING IN DACCA: Urbanization Alternative
Integrating Public and Private Resources

by
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Urbanization Alternative Integrating Public
and Popular Resources.

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Aminul Haq Khan

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for the degree of Master of Science in Architecture Studies.

ABSTRACT

The study is an attempt to identify the housing activity in the non-government sector in Bangladesh, particularly in Dacca, the overwhelming majority of which is popular. In spite of unfavorable public policies, regulations and programs, the popular mechanisms have been the source of shelter for the majority of people, of all incomes. But in the face of rising costs of construction and rampant land speculation in recent times, it was felt that Government intervention was necessary in some areas. The study attempts to identify areas and methods which can make these interventions feasible.

Since overall comprehensive changes take time, development of transportation, utilities, services and land have been identified as the areas where immediate action will be meaningful. A physical model is proposed as an illustrative example of how these issues can be translated into design.

Thesis Supervisor: Horacio Caminos
Title: Professor of Architecture

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PREFACE

This study is a continuation of a theme from my undergraduate thesis, dealing with the housing activity carried out by the non-government sector in Bangladesh, most of which is popular. Due to the role played by it up to now, it was felt that this sector has the most potential for meeting the urban housing needs in Bangladesh.

The approach to this issue has been divided into three parts, the first part includes case studies and the context, in an attempt to understand the existing patterns and process of popular housing, particularly Dacca. The second part is a discussion of inferences from the existing situation of popular housing and possible alternatives. The third part is an application of the proposed principles in a specific location, which is intended to serve as a demonstration model for future projects in Bangladesh.

Dacca has been selected to provide a specific context, partly because it is better documented and partly because it indicates the important role of the popular sector, despite the concentration of public sector programs. Except for the case studies which were done in the summer of 1981, all the data presented are drawn from printed sources. No reference has been made in the text to the sources of specific facts and

figures, to facilitate reading, and also since the data is from well-known sources and not of a controversial nature. However, a list of general references has been added at the end of each chapter.

Many thanks and gratitude are due to my advisors, friends and relatives, some of whom need to be mentioned specially. The guidance and support from Professor Horacio Caminos and the comprehensive assistance and critique of Reinhard Goether was a valuable educational experience and are gratefully acknowledged. The friendship, company, discussions and help from my classmates and colleagues were very important to me.

Special mention has to be made of Nora, Yousef, Hae Seong, Lin, Raja, Chih, Muneem, Sanyal, Akhtar, Mayank, Alka, the class of 79-81 and the class of 81-83. I acknowledge the help and support from Professor Nazrul Islam, and the center for Urban Studies, Dacca for providing valuable data for the study. Thanks are also due to Professors Abdul Hasnath and Meer Mobashsher Ali of the Engineering University, Dacca, to Mr. Abdus Salaam, Assistant Chief Architect, Buildings Directorate, to Mr. Kabiruddin Ahmed and Mr. Murtaza Choudhury, both Executive Engineers in the Housing and Settlement Directorate, and Mr. A.C. Das, Director and Mr. Korshed Alam, Planner, in the Urban Development Directorate. Special thanks are due to friends Syed Moquit, Salimulla, A.S.M. Ismail, Salehuddin Badal, A.H.M. Mahibullah, Hafeez Bhai, Montu, Khokon, etc., all of whom have helped me in the case studies and collecting data.

I am indebted to MIT and the Government of Bangladesh for partial financial support during the study. I also express my deepest gratitude to my parents, family, and my wife Suraiya, who supported and helped me out at every step.

INTRODUCTION

ISSUES: The Popular Sector has been the source of shelter for the majority of people all over Bangladesh. Even at Dacca where the Government has more housing programs than other urban areas, it houses more than 70% of the total population. However, at present due to land speculation and rising costs of construction even this mode of housing is going beyond the means of the lower income people.

The policies and programs of public housing agencies due to their regulations, specification of standards and preference towards use of permanent materials and also towards instant housing, makes it affordable only to higher income groups and creates barriers for lower income groups.

Since housing is the product of the combined efforts of users and the Public Sector, it cannot be or should not be completely regulated or provided by the government in

the existing context. While the government is limited by its financial capacity compared to the needs, it has considerable resources to intervene and assist in the development, particularly in the distribution of land and utilities.

Development of land, transportation, utilities and service can offset the rising cost of land due to speculation, can direct city growth in the desired directions and also stimulate private investments in related areas - like construction industry and home building. The Popular Sector can provide for the dwellings, but the large scale undertakings necessary for infrastructure and services call for Government action.

OBJECTIVES: Identification of the mechanisms by which housing is acquired and maintained by different income groups, in the popular sector at Dacca.

Identification of the areas where Public Sector Assistance is needed and suggestion of ways and means by which the assistance can best be combined with popular efforts, in Urbanization.

Illustration of the proposal with a design on a particular site and comparative analysis with a Government proposed design on the same site, to demonstrate how social and economic policy decisions may be translated into physical design and also achieve technical efficiency over conventional approaches.

BACKGROUND: Bangladesh is one of the least urbanized countries of the world with only 2.4% of the population living in urban areas in 1901. The rate of urbanization subsequently started to increase, but it was not until very recently (i.e., 1971) that this issue assumed large proportions. Major cities are growing much faster than others, with the pressure on the capital being the heaviest. Among 119 urban centers, the four major cities have about 50% of the urban population. The city of Dacca has experienced a 600% increase of population in the last 30 years.

Urbanization in Bangladesh has received its impetus chiefly from the deterioration of economic conditions in rural areas and migration due to political developments rather than from industrial and economic growth. Available resources and planning could not meet the increased demand for urban land, shelter, transportation, sanitation and service infrastructures. This resulted in tremendous appreciation of land values, housing shortages and deterioration of health and sanitary conditions. A recent addition to these problems is the rise of land speculation due to large sums of money coming into the country from workers abroad, which gets invested in land due to lack of viable alternatives. This has driven land values and the possession of land beyond the reach of even the middle income people.

GOVERNMENT'S ROLE: Until the late 1960's the government addressed the housing needs in terms of population categories (industrial workers, Government employees, displaced persons, etc.), undertaking isolated projects to solve their specific housing problems without any comprehensive policy framework.

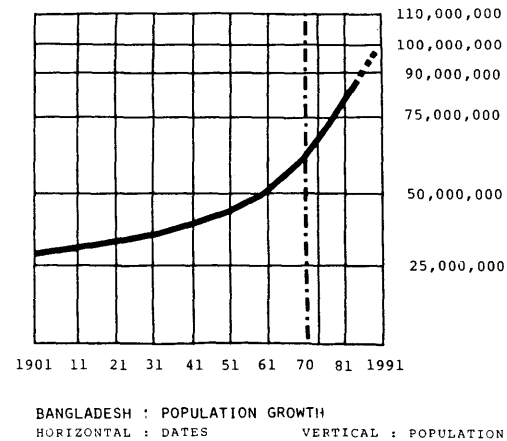
Improvement trusts were created whose purpose was largely the development of land for resale to moderate and high income Government employees, and very high income private beneficiaries. Mortgage money was made available for home building in the private sector by the establishment of the House Building Finance Corporation, but here again the beneficiaries were higher income groups. The role of the Public Sector was thus limited to the provision of housing for the Government employees and developing housing estates for the richer segment of the urban population. Their plots are characteristically large, building materials are of high quality and the densities very low in comparison with the traditional areas of the city.

Even if the government wanted to assist or provide housing in the conventional approach, it was highly restricted by lack of funds and organizational capabilities.

preferences of the individual. Apart from a few palatial ones built by wealthy businessmen and professionals, these houses are generally quite modest. They are mostly one or two stories with the exception of a few multistory flats put up by developers.

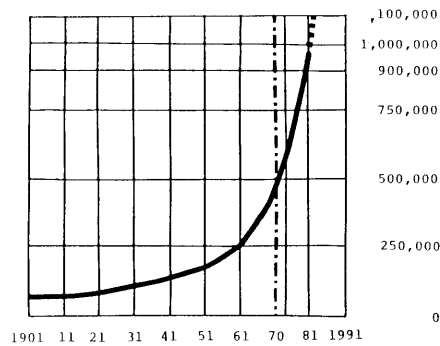
SITUATION IN THE POPULAR SECTOR: The overwhelming majority of the urban population catered for their own housing needs informally and often illegally, in the absence of any comprehensive plan for the growth of housing and community facilities. They are generally constructed within or in the vicinity of the city on high grounds or by filling up low agricultural land. The characteristic features of these areas are a wide variety of income and occupation groups, strong community ties and a very high population density. Unlike the public sector housing, these dwellings use a wide variety of construction materials, depending on the economic resources and personal

CONTEXT



URBANISATION

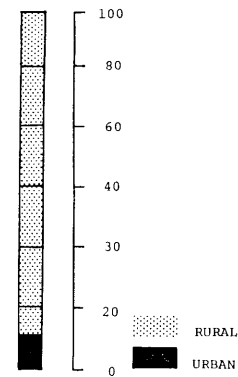
Until the 1950's Bangladesh was primarily an agricultural country with settlements largely rural in character. However, large cities like Pundranagar had been known to exist as early as the 6th Century B.C. Even Dacca as an urban area can be traced back to the 9th century A.D., when it was a part of the Buddhist Kingdom of Kamrup. Existence of cities was primarily as the seat of power and as a defense stronghold. Rivers were the main source of transport and cities flourished on their banks, due to commerce, trade and strategic importance. However, permanent cities did not take root due to two reasons. First, the shifting course of rivers (an important geographical feature in Bengal, which in current times is a significant factor behind Urbanization as it leaves many rural people landless every year), which even nowadays threatens physical removal of cities by erosion at the banks. Secondly, the capitals kept shifting frequently with the change of rulers, the capital of Bengal shifted seven times between 1202 and 1704.



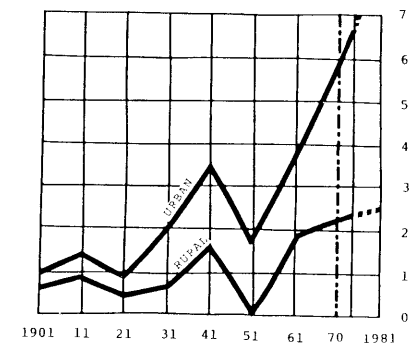
URBAN POPULATION GROWTH
HORIZONTAL : DATES VERTICAL : POPULATION

From the population census of 1901, the urban population stood at 2.4% and there were only two cities, Dacca and Chittagong with a population over 100,000. The urban population growth in the region was insignificant until the partition of India, because of the dominance of Calcutta, which was the seat of the Provincial Government and also had the largest industrial-commercial agglomeration in the region. Although the urban population growth was relatively rapid after 1947, the most significant phase of Urbanization was after Independence in 1971. The rate of population growth was more in the larger cities and the pressure on the capital city was the heaviest. The urban population in 1974 stood at 8.78% of the total population and was growing at an annual rate of 6.70% per year, and reached 11.16% in 1981.

The major component of the urban population growth is rural migrants. The factors behind this high rate of migration are twofold: In the rural areas, natural disasters like floods, cyclones and riverbank erosion coupled



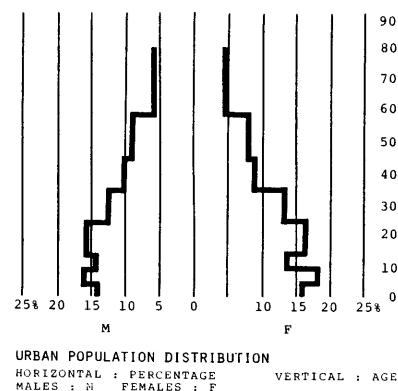
PERCENTAGE OF RURAL / URBAN POPULATION



BANGLADESH : RATE OF POPULATION GROWTH
HORIZONTAL : DATES VERTICAL : PERCENTAGE

with the high rate of inflation and deteriorated law and order leave many people without any means of survival. On the other hand, rural-urban wage disparities, industrial development, availability of statutory rationing, above, all the range of opportunities for improvement of social and economic status in urban areas encourages migration.

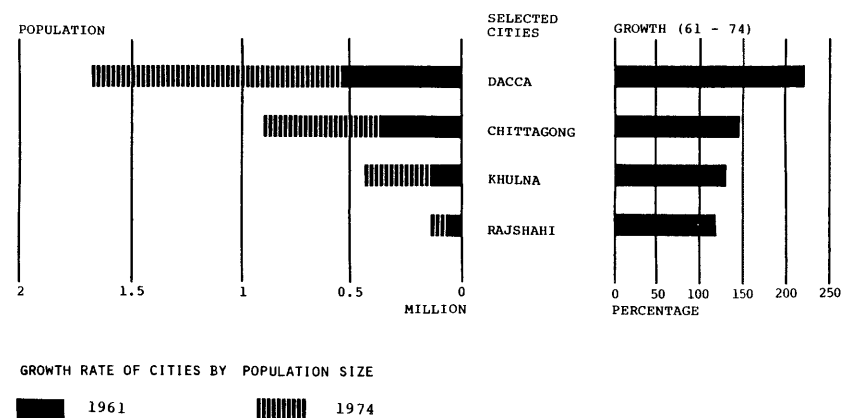
According to the census of 1974, 52% of the total urban population were lifelong residents and 48% were migrants. This figure varied from city to city and was much higher in the more urbanized areas, as can be seen from the trends in the two censuses. According to the census of 1974, about 57% of the total population in the 109 urban centers of Bangladesh were living in the 6 largest cities, with Dacca alone accommodating 27%. The last thirty years (1950-80) saw the physical expansion of Dacca from 15 square miles to over 50 square miles, a 330% increase and a population increase double that figure, i.e., over 650%. The population increased



from 338,762 in 1951 to 2,481,181 in 1981. The figure for the greater Dacca Metropolitan Area stood at 3,458,602 in 1981.

The growth has primarily been towards the north, although that towards the east, southeast and across the river were substantial. This growth has not been continuous due to the topographic features, but interspersed by stretches of low lands. However, the demand for land and the limitations of long distance transport has raised the value of these low lands, resulting in their rapid development by landfill, under individual or cooperative efforts for both residential and non-residential uses. The low lands, due to their comparatively low initial cost, attract buyers particularly from the middle and low income groups.

The uneven distribution of population is due in part to the concentration of commerce and industries in the large cities. Dacca and adjacent Narayanganj have 40% of all the major public sector industries,



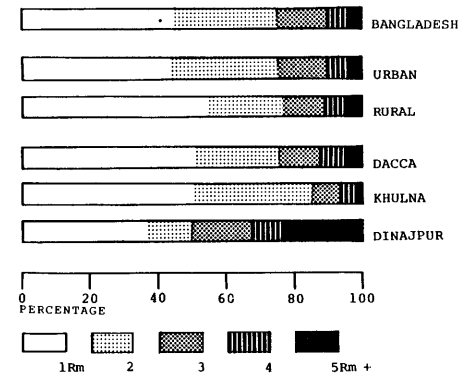
which represents over 85% of the total industries of the country. Another reason for the unequal growth is the concentration of public works expenditures in the larger cities, thus offering a lucrative job market for unskilled construction workers, almost all of whom are rural migrants.

There have been a considerable number of rural development programs in the last 30 years, especially since independence in 1971. But given the evidence about their success and the absence of alternative programs of rural industrialization, the trend towards more rapid urbanization, especially in the larger centers, seems to be irreversible, at least for the foreseeable future. But again, this phenomenon may also be successfully utilized to solve at least the country's overall settlement planning problems by planning for the expansion of urban land and infrastructure in accordance with the expected growth, rather than the process happening in the opposite way.



DACCA, URBANISATION:
 Typical picture of the urban area; population increase and the increase of striking contrast of the different income categories reflected in the difference in living quarters and the mode of transport. Squatter settlements in the foreground and dwellings of the well-to-do (top), pedal rickshaws and latest model imported cars (bottom).

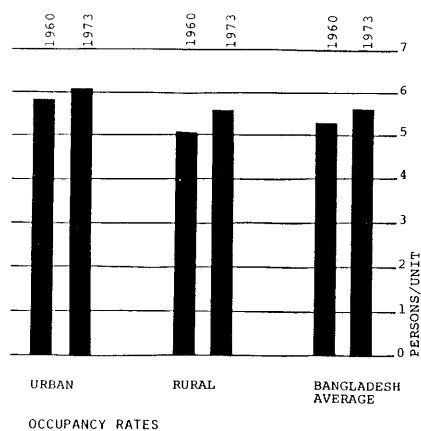
HOUSING SITUATION AND THE POPULAR SECTOR



PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY NUMBER OF ROOMS

Available Statistical Data are from either the Urban Housing Demand Survey of 1970 or from the Bangladesh Housing Census of 1973. These are organized according to materials used in construction, floor spaces/person or occupancy rates, etc., and by income groups or rural/urban classifications. No data is available on how much of those dwellings are Private, Public or Popular. However, these give a rough idea about the trends and the situation in the Non-Government sector as the Public housing component is insignificant even in Dacca, where they are the largest in number.

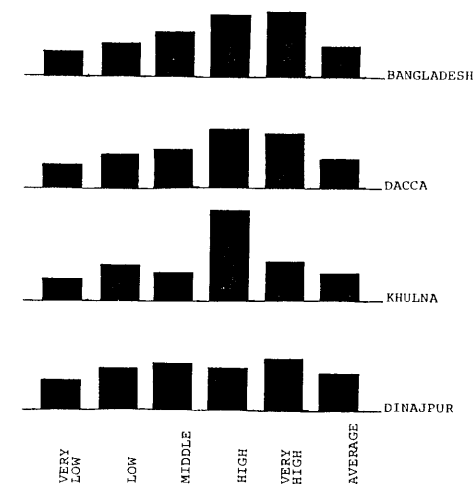
According to the 1973 Housing Census there were 13,702,916 houses in Bangladesh, about 92% of whom were being used for residences and the rest for shops, education or for offices. In Urban Areas, the figure was 78% for residential uses, with a slightly higher percentage of non-residential uses in the larger cities. This indicates the combination of uses common in the popular sector dwellings. 90% of the total houses of the country and 91% of the total households were in the rural areas.



OCCUPANCY RATES: Occupancy rates/unit and per room have been calculated in Bangladesh as a measure of overcrowding and therefore as one of the indices for calculating housing needs. This should be considered with caution as housing need is a product of the economic as well as of cultural characteristics of life in Bangladesh, where overcrowding has been the norm in both Urban and Rural areas and in all income groups.

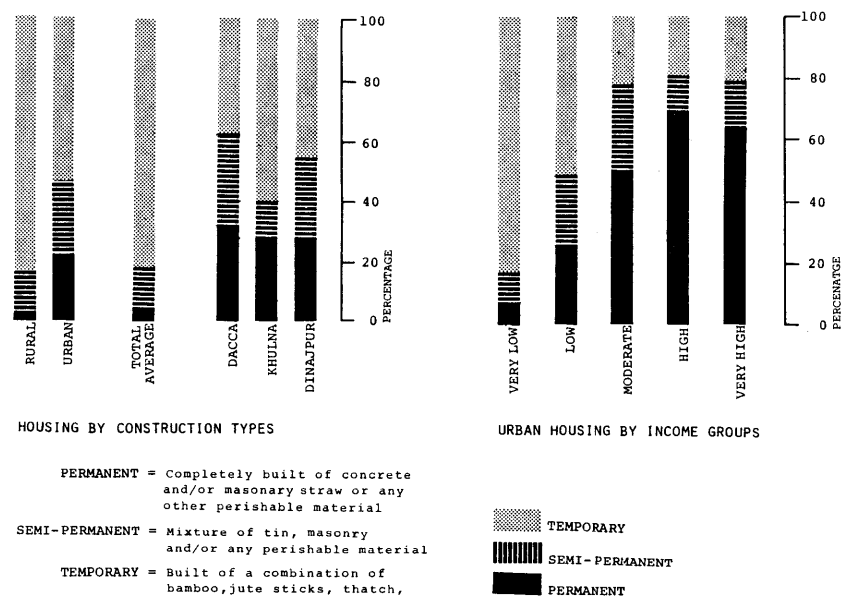
From the censuses of 1960 and 1973 it is clear that occupancy rates have been increasing fast, as the construction of new housing has not been proportional to the formation of new households. The occupancy rate again varies to a large extent between the income groups, being higher in the lower income groups. Although specific data is not available, an estimate of the difference can be made from the floor spaces being used by different income groups. In Dacca the space available to a

AVERAGE FLOOR SPACES PER PERSON
BY INCOMES



high income person, on the average, is more than twice that of a low income person added to which is the wide difference in the quality of spaces. Overcrowding and its increase was felt more in the larger Urban centers which correspond to their higher rate of population growth. In the largest city, Dacca, household occupancy per unit increased from 5.50 in 1960 to 7.65 persons in 1973, a 39% variation while the increase for Khulna, a medium sized city in the corresponding period was 21%.

It is noted from the Urban Housing Demand Survey of 1970 (chapter III and IV), that the demand for additional space was higher among residents of the larger cities, although the city may not be more overcrowded than a smaller city. This demand also varies between the income groups with the highest number of people demanding additional space being in the low income group. However, the space demanded per person is highest among the highest income groups and vice versa.



CONSTRUCTION TYPES AND STAGES: The non-Government sector displays a wide variety of materials, construction types and stages of construction.

Although available data about construction types is organized as temporary, permanent and semipermanent, the classification of dwellings, as such, is subjective. It only indicates the quality of materials used but not the permanence of the unit or the quality of spaces. Dwellings built with perishable materials need more maintenance than those with masonry and concrete, but those of the first category are more responsive to the climatic variables in terms of living comfort. It is noted that many bamboo-mat walls covered with cow dung and maintained regularly have lasted more than 50 years in Bangladesh. Nevertheless, unanimous preference is towards those classified as permanent due to less maintenance, the status it represents, physical security

and even security of tenure. But even in Urban areas where there are more percentage of permanent houses, the greater majority cannot afford to build or live in permanent houses. However, this trend continues as noted by the 1960 and 1973 censuses, because of the high cost of construction and the public financing policies which favor the higher income groups.

Most of the houses in Bangladesh are constructed in stages, more so by the lower income groups, but also by the high income groups. These stages correspond to the finances and opportunities as they become available. Those houses that are built completely at a time are mostly financed by public subsidized funding or by similar formal institutions. The terms of institutional funding dictate that the house be completed at a time which is one of the factors behind the 'instant' housing found in the non-government sector.

UTILITIES: Sewage disposal and water supply situation in urban areas of Bangladesh have to be assessed from studies which have treated the subject peripherally. For example, the Urban Housing Demand Survey, which collected data on sources of water supply and bathing facilities only. The shortage of data on this particular aspect clearly show that the focus of policies as well as studies done so far are not on urban services or utilities.

Treated piped water supply in Bangladesh is limited to a few large cities, mainly the district headquarters of the 19 districts. Even in these places, the supply is limited to the government buildings and parts of the municipal area. In the best serviced city, Dacca, the

Water Supply and Sewerage Authority is supplying water to about a million people with only 40,000 house connections and 1400 street hydrants, out of an estimated 2.5 million population. In most of the areas, water pressure is very weak and the supply is intermittent, 2-3 times a day. Individual connections are the privilege of a small number of the urban households, the percentage increasing sharply as the income goes up. The rest depend on traditional sources: hand pumped tubewells, wells and ponds. The greatest majority of people throughout Bangladesh (about 87%) depend on tubewells for drinking water whereas 50% of the people cook with pond water, which is preferred over tubewell water for cooking, as it has less iron content and does not spoil the taste of food. For other uses, ponds are the main sources, followed by rivers, well water not being popular or safe.

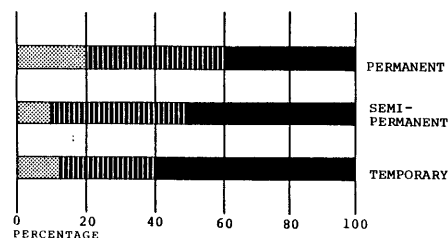
According to the Urban Housing Demand Survey about 2% of the low income groups and 46% of the high income groups have access to piped water whereas 48% of the low incomes and 28% depend on tubewells for drinking water, indicating that even this source is usually out of the reach of the urban low income groups. The average percentage of urban households without piped water is 84% and those with tubewells are 45%. The survey also indicates that a large percentage of urban households (about 65% have no "regular bathrooms", which means a separate covered room. This figure ranges between 85% in the low income group to 12% in the high income group. This indicates that the rural practice of taking baths in open ponds is practiced even in urban areas, where possible.

Conventional water borne sewage disposal systems exist only in the two major cities, Dacca and Chittagong. Even in these two cities, it is available to only a few,

mainly in the upper income areas. At Dacca, sewerage is available to about 50% of the people served by the water supply, but the response in availing connections to the system is low. In other areas and cities, government housing complexes have their own septic tanks. The rest of the people depend on pit or bucket latrines, septic tanks or lowlying water areas of the city for sewage disposal. The effluent from the Public sewage disposal systems are dumped into the river a few miles downstream from the city. Septic tanks do not work well, particularly in the rainy season when the ground water table in most areas rises exceptionally high, to about 3-4 feet below ground level. Sewage disposal demands major improvements, particularly in reaching the low incomes, so as to arrest the rampant intestinal diseases and health hazards in urban areas.

Electricity is available in all the areas of Dacca city except for the new developments taking place in the peripheral areas. But the supply and voltage is erratic and intermittent, especially during the peak demand hours between 6pm and 10pm. From electricity supply authorities, it was found that the erratic supply was due to insufficient capacity and shortage of transmission lines, rather than the generating capacity which is surplus at the power stations. Street lighting is available in the main streets and most of the smaller streets, but the level of service varies between streets and areas.

Natural gas is supplied to most of the urban areas of Dacca, but is restricted to buildings made of non-flammable materials, that is, permanent and semi-permanent ones. But the cost of installation of gas lines and fixtures is quite high and therefore not accessible to the low income groups.

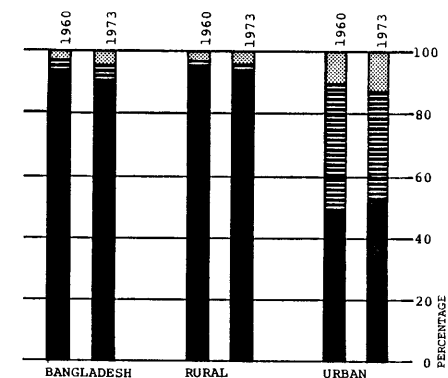


URBAN HOUSING BY TENURE



TENURE: Although the majority of households in Bangladesh own their dwellings, approximately 33% rent them in urban areas. The percentage of rented houses are proportionately higher in the larger urban centers, particularly in those classified as permanent and therefore owned as well as rented by the higher income groups. However, the largest volume of rented houses, about 25% of the total urban dwelling stock consist of low and lower middle income dwellers. There is also a very higher percentage of dwellings classified as rent free (about 12% of the total urban housing) which implies squatters or an extra-legal status, not subject to any rent or taxes. The squatter phenomenon is mainly seen in the larger urban centers. In Dacca it was estimated that about 25% of the population were squatters in 1973.

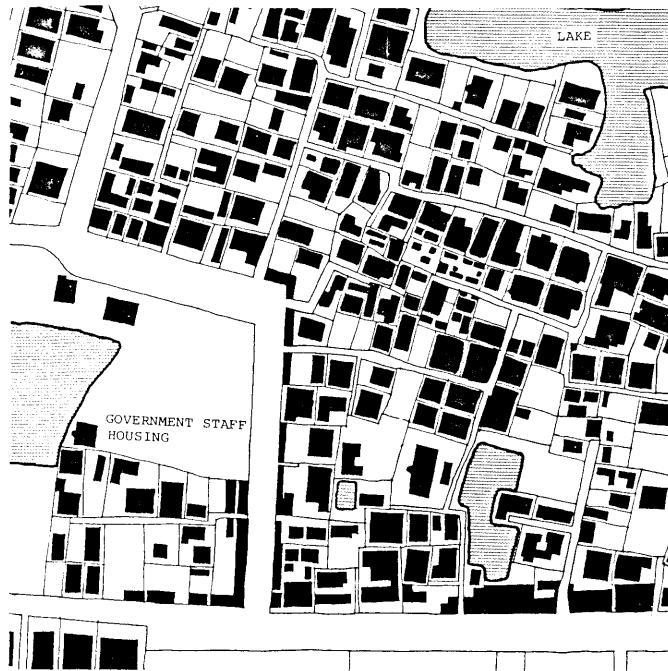
The rise of ownership in urban areas between 1960 and 1973 has been ascribed by some studies to the presence of government loan programs in urban areas. But this



BANGLADESH TRENDS OF HOUSING TENURE



clearly is not the reason, because government loans are given out to a very small fraction of the total urban population, mainly in the larger urban centers. The terms of the loans are so designed that they can be availed only by the middle to high income groups. For example, the recent "easy term loan" with which every recipient must construct a minimum of 4 stories. If the person lives in one story, the other 3 will have to be rented out, thus increasing the number of renters and concentrating ownership to a few with the benefit of highly subsidized public loans.



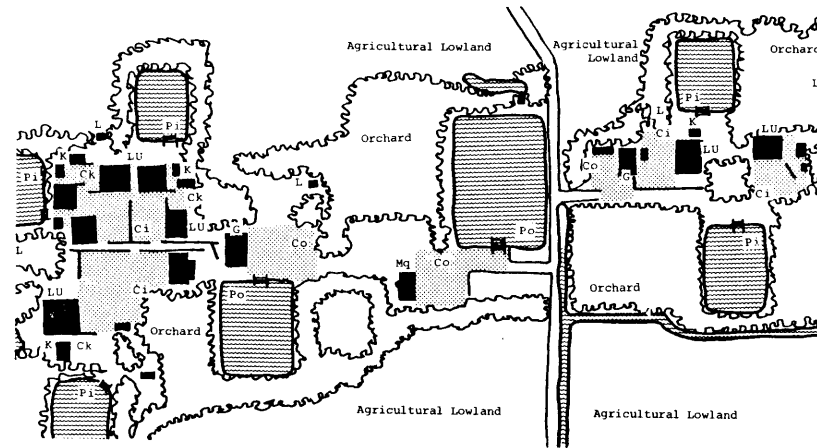
URBAN POPULAR HOUSING

PHYSICAL PATTERNS: The majority of urban dwellings in Bangladesh are detached and have clearly defined boundaries between private and public spaces. In the old parts of the cities, particularly Dacca, expansion over successive generations has resulted in attached dwellings where lighting and ventilation is achieved by means of light wells and/or small courtyards. The population density and land coverage in these areas are exceptionally high and can be up to 1000 P/Ha in places. Population density usually ranges between 300-500 P/Ha, except for

areas developed by the government which have exceptionally low densities, ranging between 70-150 P/Ha. Plot sizes in government projects are characteristically large and designated for specific income groups and uses. Those for high income groups range in size from 500m² to 2400m² per plot, although this rate is coming down in recent times. For corresponding income groups in the non-government sector, plot sizes range from 200m² to 600m² per plot.

Non-government housing is never limited to any particular income groups. High and low incomes subsist side by side, although a greater concentration of higher income groups are found at locationally more 'advantageous' and hence more expensive places and vice versa. This sector is also characterized by the lack of zoning by uses, the areas consist of all types, from industries to commercial and residential uses. The non-residential uses are located at strategically important locations depending on the layout of the particular area. Commercial uses generally grow along both sides of the streets, mostly at street intersections, forming a market place. In addition, there are small corner shops inside the lanes and the by-lanes. Community facilities like schools and mosques sponsored by the community can be found at commercially less advantageous places. It is common for the same structure to be used for residential and commercial uses, often with the shop beside the street or on the ground floor and the residence behind or above it.

The non-government sector dwellings are generally one story or walk-ups, up to four stories in height, with open spaces at the back or front. This is a response to the climate as well as to the living patterns common to people.



TYPICAL RURAL HOMESTEAD

KEY
 Co Outer Court K Kitchen
 Ci Inner Court LU Living Unit
 K Kitchen G Guest House
 Po Outer Pond Mq Mosque
 Pi Inner Pond L Latrine

USE OF SPACES AND SOCIO-CULTURAL FACTORS: One important characteristic of Bangladeshi houses is multiple use of spaces, a practice which is culturally accepted in both rural as well as urban areas. This manner of use is dictated by economic conditions and is more prevalent in the lower income groups. Multiple use by function as well as by different age and sex groups is made possible by elaborate sets of social codes and customs. From table it can be seen that 55% of the total urban houses have only one room per household and therefore, it is obvious why multi-use of spaces is common. Even the size of spaces is so small that it does not permit partitioning.

In rural areas, different uses like cooking, sleeping or entertaining guests are performed in separate structures built for the purpose. Kitchen, latrine, living units, guest house, etc., are built into separate structures, which take care of the inconveniences

and also facilitate observance of the customs. The latrines and guesthouses are shared by all the people of a homestead. This practice is carried over to urban areas, more so in the lower income dwellings where similar patterns of separate structures for incompatible uses and sharing of services for economy can be seen.

Although latrines and baths can be shared, kitchen sharing is very unpopular. Bedrooms, verandahs or even open semi-enclosed spaces are preferred to sharing a kitchen. This perhaps is due to the cultural factor of privacy of women while at work and also due to the nature of cooking, that is with firewood.

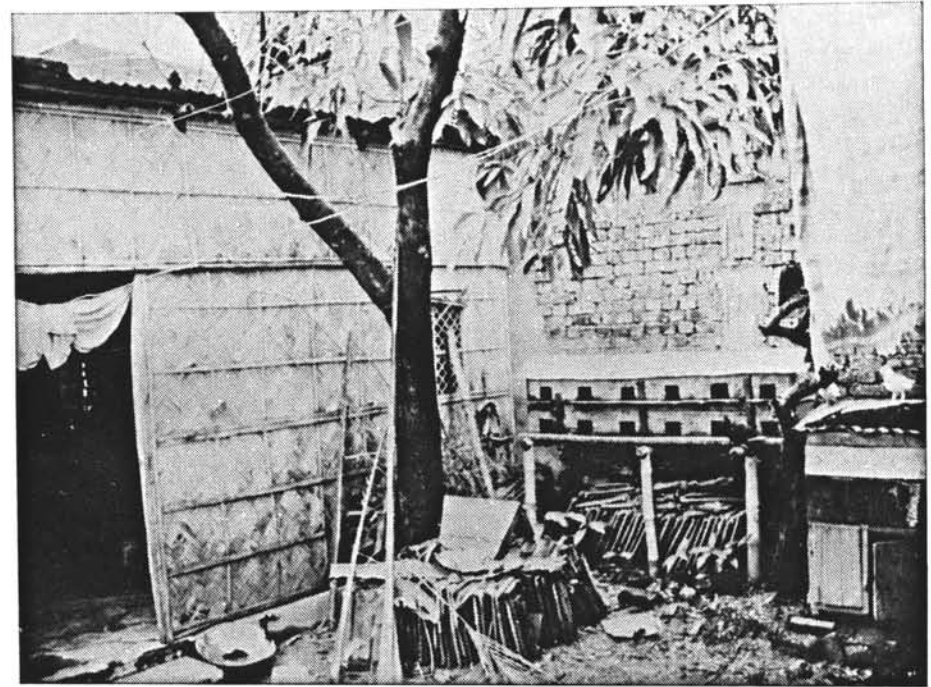
The common concept of a house in Bangladesh is an independent unit with open spaces around. In urban areas, the shortage of open space is augmented by covered open spaces called verandahs. The size of open spaces and verandahs varies according to affordability and is found to be higher as the income goes up. Dwellings in the non-government sector are exclusively of this type. This can be understood when seen against a number of factors:

1. It is a natural response to the climate in a hot, humid and high rainfall region,
2. Verandahs are more economic than closed spaces, and open spaces become an extension of the living area in fair weather at no extra cost, and
3. This type allows independent construction and provides flexibility for future construction.

PERCENTAGE OF DWELLINGS WITH EXCLUSIVE USE OF SPACE

| SPACE/INCOME | VERY LOW | LOW | MIDDLE | HIGH | VERY HIGH |
|-------------------------|----------|-------|--------|-------|-----------|
| Exclusive sitting room | 0.50 | 4.50 | 18.00 | 22.00 | 24.00 |
| Exclusive Sleeping room | 4.00 | 10.00 | 26.00 | 26.00 | 26.00 |
| Exclusive Dining room | 0.00 | 0.00 | 00.5 | 00.5 | 06.00 |

Source: ISRT, Dacca University, URBAN HOUSING DEMAND SURVEY, 1974.



USE OF YARD/COURTYARD: Three cows raised in small front yard earns substantial extra income for government employee by selling milk, Mohammedpur (left). Raising pidgeon, chicken, goat, and storage of roofing tiles for future expansion (top) Mohammedpur.

PUBLIC POLICIES AND PROGRAMMES

URBAN ADMINISTRATION IN DACCA:

Urban growth in Dacca is shaped by a number of independent organizations having jurisdiction over different aspects of housing, which often overlap. For example, a clear case exists in land development, supply of infrastructure and the operation of municipal services.

The public agencies involved in urban administration are the Public Works Department, Housing and Settlement Directorate, Dacca Improvement Trust, Dacca Municipality, Urban Development Directorate, Home Building Finance Corporation, Building Research Institute, Roads and Highways Department, Water and Sewerage Authority, Directorate of Public Health Engineering and Titas Gas Corporation.

The absence of a National Agency makes coordination of the programs and activities difficult, and in most cases, there is none at all. National priorities are difficult to establish and often disproportionate funding results. However, a positive aspect is the variety of approaches which are addressed to different needs.

PAST ROLE OF THE PUBLIC SECTOR:

Until the late 1960's, the Government addressed housing needs in terms of special population categories, for example, government employees, industrial workers, displaced persons, etc., undertaking isolated projects on a "stop-gap" basis to solve the housing problems of the particular population category concerned. Following the housing policies imposed during British rule, the Government focused on the provision of housing for its employees, carried out by the Public Works Department. Only when the refugee problem (refer to case study, Mohammedpur) became a strong political issue in 1958, the Housing and Settlement Directorate was created, which broadened the scope of the Government programs.

At about the same time, three improvement trusts were created, whose purpose was preparation of Master Plans for city development, development of land, housing, roads, commercial areas and community facilities, and planning and development control.

To help make available mortgage money for home-building, the House Building Finance Corporation was established in 1952, with power to make available direct loans to home owners of up to 80% of the home value.

All of these housing programs, until now benefitted only the upper income sectors of the urban population, except for the Housing and Settlement Directorate which partially addressed the housing problem of the lower income refugees. The main share of the production of urban housing, i.e., for the majority, went on under "Popular" mechanisms, without the blessings or assistance of the public sector.

In the absence of a program of priorities regarding urban housing, Government intervention has been mis-oriented or inadequate in meeting demands in necessary areas, for example, necessary control of the urban land market, development of utilities and transportation. Not until very recently have these gained in importance and they have been recognized in the National Plans.

HOUSING AND THE NATIONAL PLANS:

A significant change was made in housing policies in the first five year plan after the Independence of Bangladesh (1973-78). Two short-term objectives were stated in view of the rapidly growing squatter population in the major cities.

- a. Partially offsetting of demand through projects.
- b. Evaluation of the projects for making long-term policies based on these objectives.

Considering the resource limitations following projects were taken up, which were more modest in approach than previous plans.

- Multistory apartment houses in urban areas for low and lower middle income groups employed by the public sector.
- Minimum shelters and development of sites and services schemes for the low and lower middle incomes.
- Planned temporary settlements to avoid uncontrolled urban squatting.
- Framing of adequate legislation, by-laws and housing codes.
- Cooperative housing for which land and services would be developed by metropolitan agencies, cooperatives generating and mobilizing resources for dwelling construction. An outline of a Cooperative Housing Advisory Board and Cooperative Housing

Finance Corporation was made to develop future institution and policy frameworks.

The interim plan (1978-80) between the two five-year plans called the "Two-year Plan" made a few important policy revisions. The legal base of public agencies was proposed to be strengthened, to promote stronger enforcement against haphazard and substandard urban growth. Setting up of a National Housing Authority for large scale construction of low-income housing was proposed, since the housing cooperatives failed to play their expected role. It also proposed to review the conventional approaches of the Improvement Trusts in developing residential plots for sale.

The Second 5-year Plan assessed the strategies and priorities of the government in housing and suggested a more moderate approach. Construction of housing units, even for Government employees, was found to be a futile effort as there were only 15,000 government housing units constructed as a result of the last four 5-year plans, against about 465,000 Government employees in 1979. Objectives and strategies were shifted from Multistoried apartment buildings for Government employees to larger numbers of less expensive and quicker to build semi-permanent houses. Several alternative programs, like provision of core houses, utilities and finances, reduction of standards and lower specifications were proposed for easing the housing shortage of public servants. To increase the overall housing stock, provision of developed land, utilities and easy term finance was proposed. But from the proposals, it was clear that priorities in Government policies regarding housing were still in providing shelter for only the Government employees.

The Second 5-year Plan allocated the highest amount of its Physical Planning Budget, over 28%, to Housing, 55% of which was allocated for accommodating public employees. Urban sanitation and water supply also received a priority status and was allocated about 18% of the Physical Planning Budget.

The specific projects undertaken in the plan were:

- a. Construction of 40,000 housing units of semi-permanent structures,
- b. Development of site and services schemes, and
- c. Expansion of sewerage services in Dacca nad Chittagong.

PUBLIC HOUSING AGENCIES AND PROGRAMS

HOUSING AND SETTLEMENT DIRECTORATE:

The agency was created in 1958 for the resettlement of people displaced by the partition of India, and it executed 19 housing schemes in 14 cities. After the Independence of Bangladesh, it constructed a large number of multistoried flats for rent and semi-permanent structures for the squatters of Dacca. At present it has drawn up a scheme for construction of 24,800 multi-story flats to rent to low and middle income families.

URBAN DEVELOPMENT DIRECTORATE:

Created in 1965, its objectives were to prepare physical plans and development strategies for urban areas of the country, to advise local authorities on planning and to frame town and country planning legislation. Except for a few land use plans for Urban centers, nothing tangible has been achieved until very

recently. At present, its primary concerns are preparation of housing policies for the four major cities of Bangladesh and Regional Development plans for two smaller Urban areas.

WASA:

The Dacca Water Supply and Sewerage Authority was established in 1963 to extend and operate the comprehensive water supply and sewerage schemes prepared for the city, in order to meet the fast growing demand in the city. The function was performed by the Directorate of Public Health Engineering which inherited a very old and fragile system and is attempting to meet the growing demands on a piecemeal basis.

The authority is now supplying 47.5 million Imperial gallons of water daily through 40,200 house connections and 1400 street hydrants. 40% of the water produced is lost due to leakage, and a lack of stop valves on the street hydrants. Per capita water produced is about 100 litres/day, but the losses reduce this to 60 litres/day. This, of course, does not indicate the availability of the same amount of water to every person or every area of the city. According to a rough estimate, about a million people in the Metropolitan Area have access to the water supplied, and in some high income residential areas, large lawns are watered from this supply. Whereas, in most of the old city, the supply is so meager that hardly enough drinking water is available. The supply system is augmented by "Vistis" or water carriers supplying water from street hydrants to the dwellings, particularly in the old city. Those who cannot afford connections pay many times more than those with connections, for the same amount of water.

The costs and the administrative maneuvers necessary to gain a water connection prevents the majority of the lower income people in the popular sector from getting connections.

Although a conventional waterborne sewage system was introduced in Dacca in 1923, its coverage compared of the city is extremely low. Work on the system was expanded by 17 miles of Trunk lines, 112 miles of lateral sewers and 8 lifting stations until 1978. Despite these expansions, the number of connections have not been low, with only 7,800 connections added in 1977 because of the high cost.

DACCA IMPROVEMENT TRUST (DIT):

The trust was established as a result of the enactment of the Town Improvement Act in 1953, with the objective of Development, Improvement and Expansion of Dacca, and adjacent Naryanganj, including areas in their vicinities. Its policies are drawn by a Board of Trustees representing various Urban Planning and Development institutions in the city. Similar organizations were created in three other cities.

The contribution of DIT to housing up to now has been the development of land for sale, the beneficiaries of which were the high income groups. Terms and conditions for sale of these plots explicitly state that preference for these plots would be given to doctors, engineers, lawyers and other professionals. Recently, they have focused their terms in favor of professionals working in the Middle East, and the preference is given if payment for land is made

in foreign exchange. About 10-20% of the cost of the plot is deposited as security, at the time of application. In the past, the housing estates provided very large plots. In Dhanmondi, plot sizes were between 750m² and 1500m². In Gulshan the range was between 1500 to over 3000m². The plot sizes in recent developments are decreasing and range between 350m² and 1000m². Even these are much higher than the plot sizes found in popular developments, most of which are in the range of 150 to 250m². The plot sizes, regulations and the stated focus of DIT programs have effectively precluded low and even most of the middle income group from buying those plots.

The funds for DIT come from the Municipality, loans from financial institutions, Government grants, rents from markets and the proceeds from land sales. Due to the failure of most of the income generating schemes (like the markets which were constructed in unfavorable locations and are not rented out fully even after decades of their completion), and the shortage of Government funds, DIT's activities are said to have become restricted to developing housing estates for the wealthy, which readily generates income for the corporation.

HOUSING FINANCE

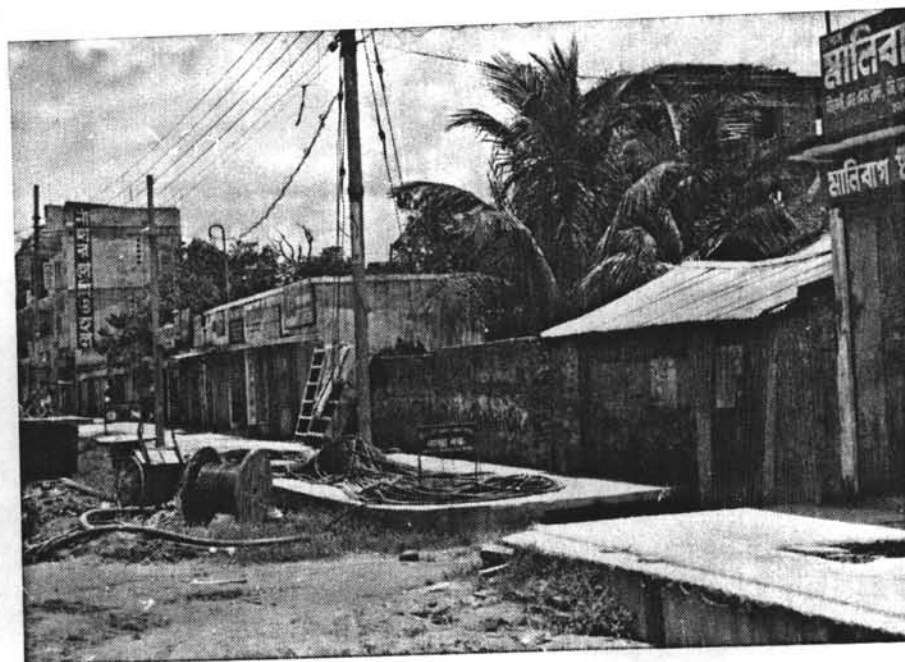
HOUSE BUILDING FINANCE CORPORATION:

This is the only public agency providing loans for housing to individuals and housing cooperatives against the mortgage of the land and building, after the plans for building are approved by relevant authorities. The maximum loan ceiling is approximately Tk175,000 for one complete unit at an interest rate of 11%, with a repayment period of 20 years. The loan amount is calculated at about 75% of the construction cost, excluding land. Loans are granted in installments as the construction of the building proceeds. The rate of interest was recently raised to 13 1/2%.

In 1978 a new loan program at concessional interest rates has been started for the purpose of promoting construction of multistoried apartments for the middle income. The conditions imposed are that all the dwellings must be a minimum of 4 stories in the major cities and 3 stories in other cities, completed at one time. Each flat or unit should be self-sufficient in terms of facilities. The rate of interest is tied to the size of the unit and is 5% for units with a plinth area of up to 75m² and 7% for units up to 140 m² plinth area. For the first category, up to 95% of the total cost of construction and for the second up to 90% of the total cost of construction is provided by the agency, with the repayment spread over 25 years. Three nationalized commercial banks are also giving similar loans for construction of multi-storied dwellings, but only to organizations under similar conditions as the HBFC.

Other means of financing housing are loans or salary advances from the employer, deductible in in-

stallments from future salary payments. But this kind of loan is accessible to only a few lower income people, and only those who have had a permanent job for many years, a phenomenon more uncommon as the income level goes down. The majority of people have to depend on personal resources and informal loans from friends or relatives for housing construction.



PUBLIC PROGRAMMES; Housing for Government employees, expensive units and inefficient land utilization, cannot reach 20% of the employees even at Dacca (top). Popular developments already in a mature stage before utilities are laid out (top right). Queue at community outlet when water is supplied, note loss of water due to absence of tap.

ISSUES

LOCATION, PROJECT SIZE AND COST

Observations and inferences from case studies at Dacca and other cities of the non-industrial world suggest that location is the most important factor in the success of a housing project. The type of employment is also important in orienting projects according to the needs and potentials of a particular income group, especially in lower ones. For example locating newly arriving rural migrants near industrial areas does not serve the purpose of employment because those workers require skills in particular occupations, whereas rural migrants are usually unskilled, at least in technical occupations. (Refer to Table XII in Appendix). An important factor in locating these income groups is the availability of jobs requiring little skills. Another important factor is the availability of additional or second jobs within walking distance. Second jobs are those done either by the household head after normal working hours or by the housewife or even children and is an important source for augmenting household income. In Mohammadpur this was found to be very common, and more so in the lower income groups, where people worked at odd jobs at odd hours. Housewives and even children helped substantially in betterment of the family economy.

The flexibility in location decreases as the income decreases and in the case of Marginal income earners their livelihood depends on employment availability from where the whole family can participate in earning enough income for survival and economic advancement. The seriousness of this

was felt when about 200,000 squatters were relocated by the government from center city locations to resettlement camps in the periphery of the city, one of the camps being in the Industrial area, Tongi. Although they were provided with a room, medical care and rationed food, most of them returned to the city at the first opportunity. Less than half of the original people remain there now and those who do remain do so because of hope that they will be given the parcel of land on which they live now, free of cost. Most of them lost their jobs and thus their means of livelihood and faced starvation, and in other cases family earnings were reduced to the income of the male members, which was further eroded by the expense of transportation to and from the place of work. This was corroborated by experience of the author and information acquired from some of those squatters who were removed.

But location of new low income housing projects in areas close to the city center brings into focus the question of viability in terms of availability of land, feasible project size and above all the cost of such projects where the targeted income groups may ultimately be priced out.

It is difficult to find unbuilt areas large enough to warrant public agency involvement, or of a size large enough to make a significant contribution in meeting the demands. However, another approach that could be tried is to develop smaller plots at better locations, mainly as infill to existing dwelling environments. In Dacca a large number of small open spaces are available

as indicated by the 'Urban Housing Study' for the Urban Development Directorate in 1979. The location need not strictly be close to the city center because normal walking distances vary, and usually increases as the income of a person decreases.

The cost of land in locations closer to the city is bound to be more expensive than in peripheral areas. However, the cost of a project is not only the function of the cost of land but also that of land development, cost of infrastructure, density, lot sizes and land utilization. The cost of putting in infrastructure in smaller projects tend to be higher, but in case of projects in areas within the city, advantage can be taken of existing trunk lines without additional expenses. In addition, most services already exist in the surrounding areas which would make the project area more desirable than peripheral locations.

Project costs can be brought down appreciably by designing for higher densities (which would necessarily mean smaller plots) and by more efficient land utilization. The densities of areas developed in the past by public agencies in Dacca have been dramatically lower than those found in the popular/informal developments, (refer to table VII sample densities of residential areas in Dacca). The cost of land can be defranged and a more cohesive community growth promoted by providing for mixed incomes and mixed uses in projects. Cross-subsidisation may also be used. By developing land for sale for commercial uses at higher cost than residential uses, the potential for which is greater for inner city projects, and by differential pricing of different sized lots, housing could be made available at a lower cost to lower income groups. The

Cross subsidy approach could also be tried between inner city and peripheral projects.

Mixed income and mixed use development are not only helpful in realizing project costs but also provide for income generation for future development of the projects. This was seen in the Mohammedpur case study, where service oriented trade emerged between the low and high incomes where one became the seller of goods and the other a buyer with benefit accruing to both.

The cost of land in the inner city areas as well as the viability of peripheral sites is in part a function of the transportation systems of the city. In Dacca the prices of inner city land are kept higher by the lack of a viable network of public transportation system, serving different needs and incomes. The most dependable means of transport is the human powered rickshaw, which, although versatile is limited by its capacity to reach distances more than 3 to 5 miles, the passenger capacity, the time consumed and the prohibitive cost. Buses, the means of transport which most people in the low income use for longer distances as found in the case studies, are very irregular and always overloaded. Despite the efforts of the government, the public transportation system has not been improved much in the past two decades. Improvement of public transportation has been a reason for serious concern in Dacca as can be seen from the frequent newspaper headlines and cover articles in magazines. In this situation, it may be feasible to develop smaller inner city projects, which would also be more easily sold.

But the location of a project would depend on a trade off between project size, costs, density and desirability, which have to be determined in terms of particular projects, and the target income group.

TRANSPORTATION AND CIRCULATION:

The topographic conditions in and around the Dacca urban area restrict expansion into adjacent areas. The built up area has extended to the limits of available highland in all directions except the north.

The pressure on land is further increased by lack of viable public transportation systems, especially the local long distance ones operating between the periphery and the center city areas. The most reliable transport the pedal rickshaw is time consuming, expensive and limited to short distances only. It is believed that improvement of transportation systems which calls for government action will contribute significantly to improvement of the housing situation. It will mobilise private investments in land development and homebuilding, since this is traditionally seen as a secure investment.

Study of the circulation system of Dacca shows a predominance of radial highways entering the city and an absence of ring roads. Development has followed these radial highways in a linear pattern. Pockets of less or underdeveloped land are left between the radial roads. This is also due to the topographic features, which are in the form of fingers or narrow strips of buildable highlands. A system of ringroad should be developed to provide linkage between peripheral areas as well as to open up and provide better access to the pockets of less developed zones within the city area. This will generate new developments as seen in previous experience in Dacca, when new roads were opened.

LAND AND INFRASTRUCTURE:

Land speculation and increase in land prices has been a common feature during the last few years in Bangladesh, both in rural as well as in urban areas. This may have been the result of economic instability since land is seen as the most secure form of investment. In recent times this was aggravated by foreign exchange remittances from expatriate workers in the Middle East. The problem is more acute in urban areas where there is an increasing number of speculators or potential investors eager to buy land and build a house with ready cash, and an increasing number of penniless rural migrants, looking for employment and cheap shelter. For the first category, priority is ownership of land, and for the latter it is security. To both groups it is crucial for their social and economic development.

This situation calls for some Government intervention, by controlling the urban land market or by channelling remittances in other directions. However, the alternative feasible for immediate action and less time consuming would be to make more land available for easing the pressure on urban land.

Identification of new land for large scale developments in the periphery and small scale projects in the inner areas of the city would be a first step to offset speculation. The particular locational situation of Dacca makes land development very difficult and costly. To the south is the river Buriganga and to the east, west and part of the north are low agricultural lands which are subject to monsoon flooding. Wide fingers of these lowlands extend into the city areas and serve as the storm drainage for the whole city. Development of these peripheral lowlands would need an average 10 to 15 feet of landfill which would be a great

expense. However the wide bands of lowlands inside the city limits provide a more feasible alternative to pursue and this is already being carried out on an incremental basis, individually or by cooperative housing societies. The largest possible area for this are the lowlands between the capital complex, Mirpur and the cantonment. Other areas are between Tejgaon Industrial area, Badda, Rampura and Maghbazar or the area between Kathalbagan, Kalabagan, Kawranbazar and the Capital Complex. The land value in and around some of these areas have risen high enough to make landfill feasible. However, the Storm Drainage of the city which runs through these lowlands would have to be solved then.

Except for a large stretch of highland to the north and Keraniganj to the south on the opposite side of the river, very little options remain for the expansion of Dacca on highlands. However, the costs and technical problems associated with landfills will direct the expansion of the city towards the already available highlands to the north.

Land to be developed requires services and utilities. But Dacca and other urban areas of Bangladesh have poor provision of utilities and infrastructure or are not available at all. Despite consistent efforts of the Government the increases in the capacity are outstripped by the rise in demand. Another factor restricting improvement of utilities is the poor state of revenue collection. As noted in section Public Policies & Programmes, WASA draws its revenues from only 35% of the water supplied, according to the Dacca Directory of 1977 (A.K.M. Shamsul Huda, Times Publications, 1977). All expansion programmes are funded by grants from the Government or from International aid agencies, the revenue from sales being insufficient even for normal operating expenses. It has been noted that the major share of the uncollected revenue so far is from large public sector corporations and their housing estates rather than

rather than from individual subscribers. Clearly the improvement in revenue collection systems and reduction of losses (which simply means installation and maintenance of taps at the public hydrants) would go a long way towards improvement of the water supply situation.

Development of alternative technologies for water supply and sewage disposal etc. is one of the priorities in terms of new developments, especially in those at the periphery of urban areas where it is very expensive to make services available.

Considering costs and priorities of the people, provision of electricity and water supply should occur initially. Sewage disposal can take place with pit privies or septic tanks, as is customary. Conventional waterborne sewage disposal is extremely expensive in Bangladesh, but because of the high water table pit privies or septic tanks do not work well, especially in the rainy season and in the urban areas they are a potential source of health hazards and can contaminate the ground water. As seen from the Urban Housing Demand Survey a very high percentage of urban households depend on shallow handpumped tubewells for drinking water. It is easy to imagine the seriousness of the problem, but the financial limitations compared to the needs make it impossible to extend conventional sewage disposal systems to all areas. Even if it were possible to extend the main networks to all areas the cost for taking connections would be so high as to preclude most of the population unless highly subsidized. In Dacca it has been observed that in some areas where the networks have been extended about 50% of the population either did not or could not gain access to it, mainly because of the high costs.

In the absence of a safe alternative sewage disposal technology, the viable option would be to expand the networks and access to treated water, so as to reduce dependence on surface water sources and handpumped tubewells.

HOUSING FINANCE:

The existing housing situation and the case studies clearly show a relationship between the nature of development of a dwelling unit and its financing sources, in urban areas of Bangladesh. Those built with public subsidised finance seemed to be of the instantly developed and were built of high quality materials and high standards. Most of them are multistoried and are usually owned by the high or moderate income groups.

The reasons for the above may be found in the regulations and conditions imposed by the loan. Special reference has to be made of the recent easy term loan, started initially at 5% simple interest and subsequently raised to 11%. The conditions of the loan are that the unit has to be at least four stories with one independent flat in each floor. The reason for this as given in the official announcement, was to increase the dwelling stock and to check the horizontal spread of the city in view of the shortage of land. Although the floor spaces specified were small (less than 75 m² per unit in one typical programme and less than 112 m² in another), this called for a high material quality and standards, which are unaffordable to the large majority, (refer to tables in appendix and chapter Housing situation and the popular sector). Calculating the costs, the government finances upto 95% of the total cost of construction.

The result of the loan programmes has been the concentration of large sums of capital to few people (who are doing a good business by renting out the extra units) at the benefit of public subsidy. The high standards and the high amount of subsidy made it lucrative for the higher income groups who are usually more influential and therefore have better access to the loans.

In case studies it was found that the low income groups were apprehensive of taking large sums even if it were available because they were afraid that it may not be possible to repay that sum or even to invest it properly, resulting in loss of ownership of both land and structure.

It would more appropriate to have small packages of loans with less complicated procedures and with lower material standards. It would be more helpful if the loans were available in stages, as the building activity progresses incrementally.

The validity of the Government's policy of increasing dwelling stock and promoting higher densities through multi-storied units is debatable, but serious is the question of furthering a difference of income through public subsidy. The smaller loan amounts and quality specifications will not only increase the dwelling stock but also reduce the disparity of incomes and general living conditions in the urban area.

RECOMMENDATIONS

Based upon the conclusions that can be derived from the existing housing situation in Dacca, tentative recommendations can be made as an approach to assist and coordinate small scale popular efforts as a means towards a large scale urban development strategy. From a review of the existing situation, it is evident that very little has been achieved so far in meeting the housing needs, especially for the low-income groups. The reasons may be found in the Government policies, regulations and its programs. From the case studies, it can be seen that the best results may be obtained if government activities are focused primarily on the large scale activities.

The recommendations can be made at two levels:
1) General, dealing mainly with urban scale actions, and 2) Projects, concerned mainly with translating policy issues into designs. The project level recommendations are illustrated by a design for a Site and Services project on a specific site compared with a government design proposed for the same site.

GENERAL RECOMMENDATIONS

The areas identified for government action are:
a) Comprehensive change in the legal base of regulating agencies, making their approaches as well as access to them more feasible. Clear definition of their objectives and scope of work is also necessary, as well as a re-definition of the rules and regulations. b) Control of the urban land market and effective measures to offset speculation. c) Shifting of focus of credit facilities from large amounts for a small number of people to small amounts to achieve a larger distribution. Mechanisms

should be devised for easy access by the lower income, many of whom are not literate. At the same time, effective measures have to be devised to realize credits over time, in order to make more credit available. d) Focus on large scale public works, including development of urban infrastructure networks, transportation and land development.

However, since comprehensive changes are highly time dependent and could only be a part of a long term strategy, priorities have to be identified for immediate action. The least controversial and effective measure to be taken is the development of large scale urban infrastructure networks, transportation and circulation systems improvement, more effective land development, and better financing distribution.

TRANSPORTATION AND CIRCULATION:

Improvement of the public transportation system and expansion of its networks have become very important in Dacca, in view of the limitations of the existing systems. Particularly, the longer distance local transport plying between the periphery and center city areas, need to be improved in volume and frequency. An unreliable transportation system has been one of the major deterrent factors for the expansion of the city, and improvements will bring more areas within easy reach and will generate housing activity.

A quick look at the map of Dacca shows the absence of major ring-road linking the peripheral areas. This is somewhat related to topographic conditions, but the result is a form of linear development along the

main highways entering the city areas. A system of ringroads should be developed which will not only provide better linkage between peripheral areas, but also open up new areas and generate development, which up to now are lying as pockets of undeveloped land between peripheral highways.

LAND DEVELOPMENT:

In the context of the alarming increase in land speculation in Dacca, large scale development of land has to be controlled by the government. These developments should be designed for mixed income groups and mixed uses. This will not only facilitate growth of a harmonious community, but also will serve the purpose of cross subsidizing the housing for the lower incomes.

Land development should be carried out as follows:

a) To develop large-scale housing projects on the periphery, and b) Development of small projects in and around the inner city areas, and if economically feasible, the wide belts of low agricultural land within the city areas.

To reach the housing needs of the lowest incomes who are mostly newly arrived rural migrants, government should take up projects of renting sites provided with services. This is a prevalent practice in Dacca and other urban areas of Bangladesh, where landlords rent their land without any services. These are very convenient for newly arrived migrants and the lowest income groups as they are very cheap, and since they

are not tied down to any specific site. As their jobs keep shifting, they take their shacks with them and put them up in a different site. The Government should provide the land with adequate services, since the sanitation and health conditions in such settlements are unsatisfactory.

INFRASTRUCTURE SYSTEMS

The infrastructure systems in Dacca are particularly weak and do not provide adequate services to the existing population. Provision and improvement of services will generate new development. The priority of services to be developed needs to be established, due to financial limitations and also to spread available resources to the maximum area possible. Water supply and electricity are the priority as seen from the case studies and existing conditions.

Sewage disposal in the initial phases can be taken care of by pit privies and septic tanks, as is the usual practice in Dacca. A conventional sewer system - being the most expensive - can be put in as the development matures and thus costs can be spread over a larger population. However, alternative sewage disposal techniques for a hot humid climate and with a high water table need to be explored urgently.

FINANCING:

Availability and access to easy term financing has been found to be instrumental in the development of housing, particularly units of the high material quality and specification standards. But the past records show that public subsidized financing has been limited to a few groups, and mainly benefits the upper income groups. The amount of credit extended to individual borrowers was large, and the stress was on the use of permanent and expensive materials.

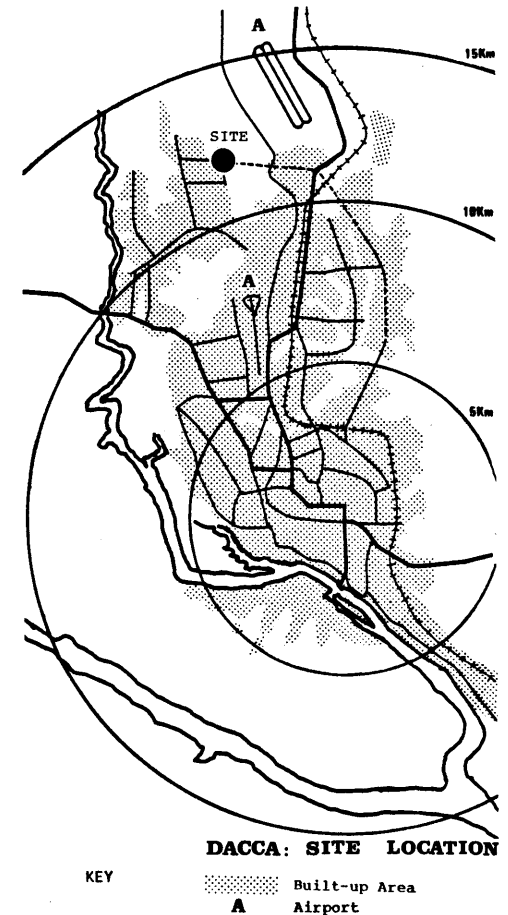
The terms should be focused toward the needs of the lower incomes - i.e., provision of small amounts of easy credit not tied down to high material specifications or standards. The paperwork and administrative maneuvers required should be made simpler. From the case studies it was found that if very small packets of credit are provided at intervals of a few years or in intervals as required, it becomes more viable for low income earners. Usually these groups are not ready to take more credit than they can manage to invest and to repay, and are apprehensive of losing the tenure of the land. Also, they have difficulty in the incomprehensible paper work and procedures.

PROJECT PROPOSAL



0 5 10 Km

1:250000



The proposed site and services project is part of a more comprehensive urban development program. The overall program includes employment generation, transportation, housing infrastructure and services, with the aim of reducing the burden on the public sector and encourage private initiative for homebuilding. Considering the difficulties of coordinating such an approach with the existing institutional framework, only a limited number of site and services programs and upgradation projects have been identified for immediate action. As noted earlier in the issues and general

recommendations, the priorities are less for housing projects and should be focused more in the development of transportation and circulation systems and infrastructure. Although there are some doubts about the selection of the site, the priorities of the project and project size, preliminary design studies have been made on the same site as a government proposed project, with the goal of demonstrating how the contextual issues may be translated into project level design decisions. In addition, the design will serve as a model for site and services projects throughout Bangladesh.

SITE DATA

| | | | |
|--------------------------|--|-----------------------|---|
| | | COMMUNITY FACILITIES: | Market, Schools, Mosques, available in adjacent housing communities |
| | | EMPLOYMENT: | Limited, in nearby industries |
| | | TRANSPORTATION: | Two public bus routes and several mini-bus and auto tempo service from terminal nearby. |
| LOCATION: | Mirpur Section, 12.19 Km. from the city center, approximately 7 Km. from the international airport through proposed road. | AREA: | With initial boundaries - 100 Ha. With revised boundaries - 108 Ha. |
| DENSITY PATTERN: | 225 Persons/Hectare | SHAPE: | Highly irregular initially, modification proposed. |
| INCOME PATTERN: | Low, Middle and some High | BOUNDARIES: | North and East: Low Agricultural lands, private as well as public ownership. West and South: Ceramic Industry, Low income housing and squatter resettlement project. |
| LAND TENURE: | Public agency legal owner | | |
| LAND COST: | TK. 125,000/Ha. (\$8,333/Ha.) | | |
| LAND FILLING COST: | TK. 53.0/m ³ (\$3.53/Ha.) | SOIL: | Clay, Landfill has low bearing capacity initially. |
| TOPOGRAPHY: | Undulating, ranging between -3.5m to +12.8m. Highest in northern part. 3.5m. average landfill required to raise site above the +7.0m. abnormal flood level, during the rainy season. | OTHER FACTORS: | Most of the site goes under water for a short period, during annual monsoon flooding. Little smoke from adjacent ceramic works. Little noise from two airports about 3-5 Km. away. |
| INFRASTRUCTURE: | (E) Water supply - Limited, feasible WASA (E) Sewage disposal - Limited, feasible WASA (P) <i>Projected</i> (P) Storm drainage - Limited, feasible, surrounding lowlands (E) <i>Existing</i> (P) Refuge disposal - Feasible, Municipality (E) Electricity - available, PDB (E) Telephone - available, T&T | CLIMATE: | Winter: Humidity-moderate (45-75%) (Nov-Feb) Temp.-moderate (24°-30°c) Summer: Humidity-high (60-90%) (Mar-Jun) Temp.-high (30°-36°c) Rainy: Humidity-high (85-90%) (July-Oct) Temp.-moderate (29°-30°c) |
| APPROACHES/ ACCESSES: | Proposed ring road on the east connecting to Dacca - Mymensingh highway. 37m. wide road to southwest connecting to Dacca - Aricha highway or through cantonment to center city areas. | | |

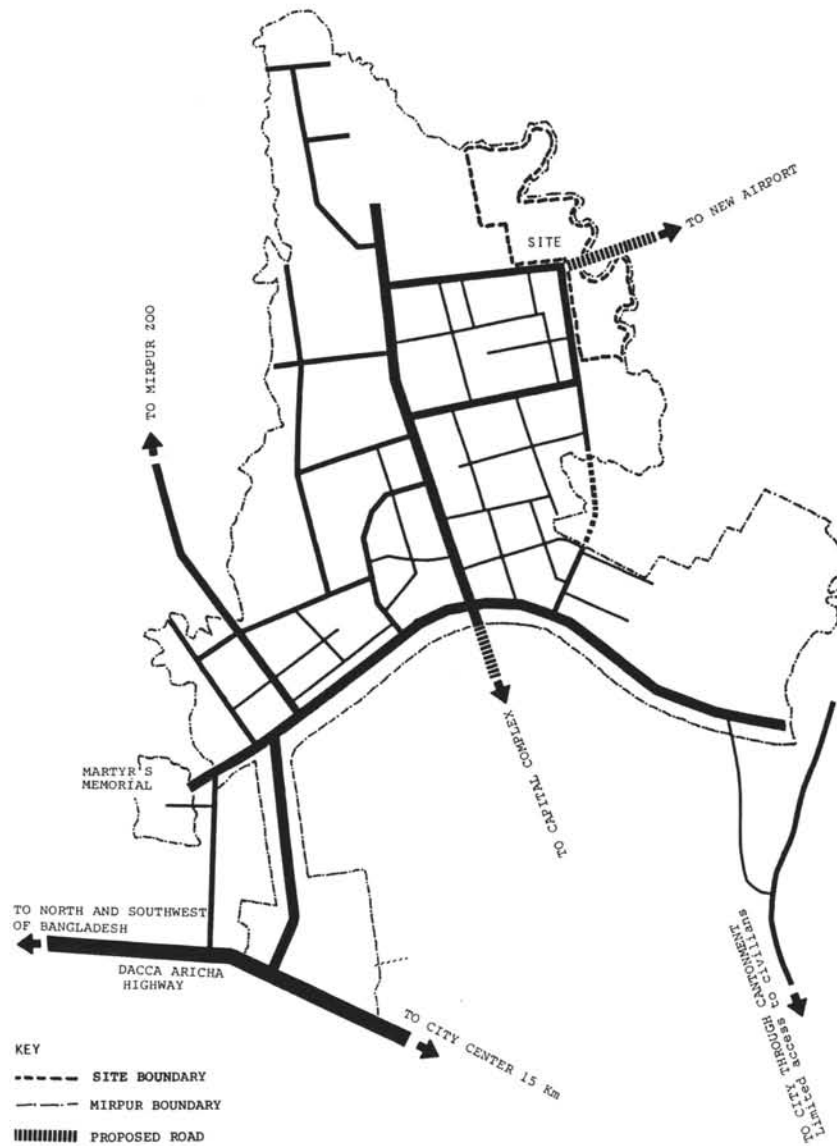
SITE CONTEXT

The site is located in Mirpur at the northern periphery of Dacca City. Mirpur was designed as a satellite town for Dacca in the late fifties. Due to the topographic features of the region, it is isolated from the rest of the city except for a roundabout link through the Dacca-Aricha highway and a limited access road through the Dacca Cantonment. There is a proposal to link Mirpur with the new airport by a 30m wide road, which will in future become a ringroad through Badda and will link with the central business district of Motijheel. This road goes through the site and will be an instrumental factor in making the site desirable for housing and will contribute significantly to the development of Mirpur in general. Due to the importance of the road, it has been included by the government as part of the proposed development program, and the cost of the road is being borne by funds from the project. (It may be argued that the expenses should be borne by the Mirpur Municipality, and the future landowners on both sides of the road through development taxes because they will benefit most from the road.)

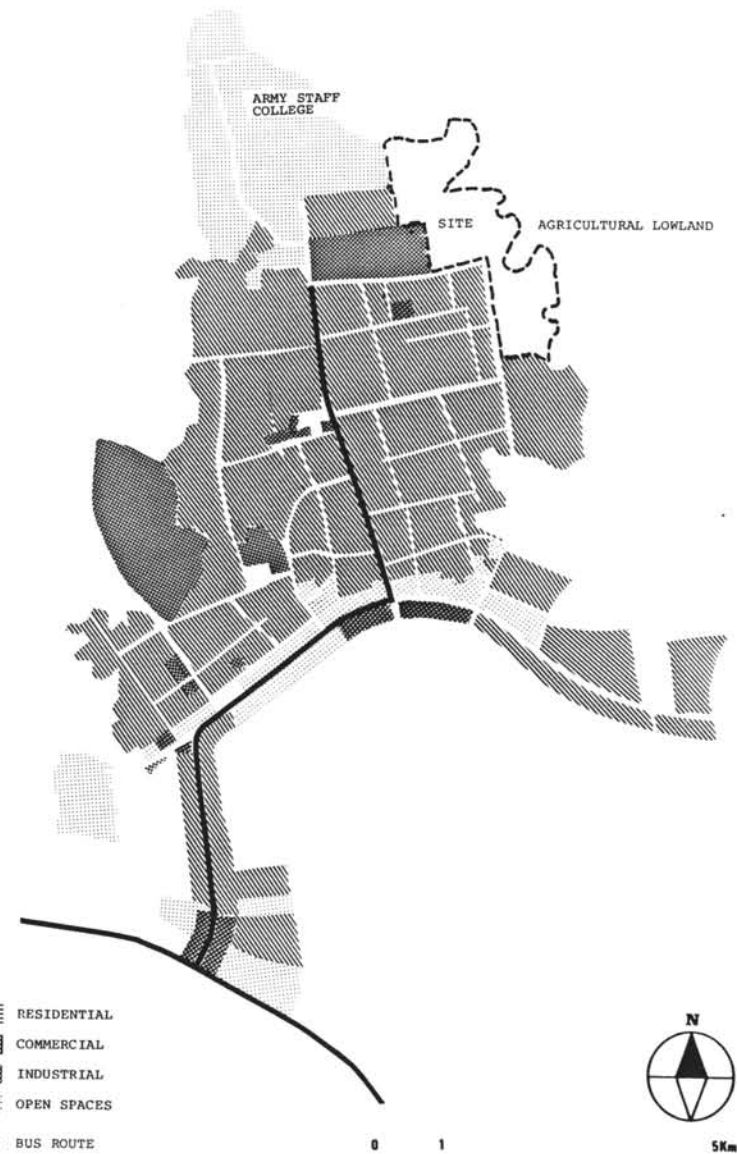
Although at present the site is at a disadvantage because of the distance from the city, this was selected with the hope that the links would be significantly improved by the two proposed roads as shown in the circulation diagram and also because it was the only site which was readily available without requiring time consuming administrative efforts. Two other sites, one at Kalyanpur and the other at Demra, were initially reviewed, both of which are at more convenient locations, particularly at Demra which is about 4km from the city center. Those could not be obtained since they are under the jurisdiction of other agencies who have different perspectives and priorities regarding development of those sites. Acquiring those sites would have meant,

at the least, time consuming negotiations.

At present Mirpur is a municipality divided into 17 sections, and is a residential area with some heavy industries and quite a large number of small scale cottage industries. The initial program called for the development of 700Ha. but was increased several times and now consists of about 1340Ha. The predominant income groups are low to middle, with a significant number of high income groups settling more recently as Dacca expanded and Mirpur developed. The area is developing very fast mainly due to the high level of government investment, but private investment is also increasing. The government has financed the construction of about 9,000 core houses and 4,000 flats and development of 7,900 serviced plots initially in Mirpur. After independence several thousand more government flats, three large squatter resettlement projects, and army training academy, a police lines, a road research laboratory, a building research institute, a telephone exchange, two trade schools, a large insulation and sanitary-ware factory and a significant number of community facilities. Private funds have financed a machine-made brick factory adjacent to the proposed site, a dairy plant, a pharmaceutical industry, a rubber goods factory, a steel re-rolling mill, a glass blowing factory and a large number of small scale industries like weaving, joinery, household articles, bamboo mat manufacturing, aluminum goods, etc. In a survey, almost all of the small scale industries were found in the smaller residential plots and core houses - with plot sizes about 7.5m x 15.2m, and much of the activity going on in the street in front. All of these industries are combined with a shop at the front and a dwelling unit at the back. Little distinction can be made of the spaces by use, for all of the spaces are multi-use.



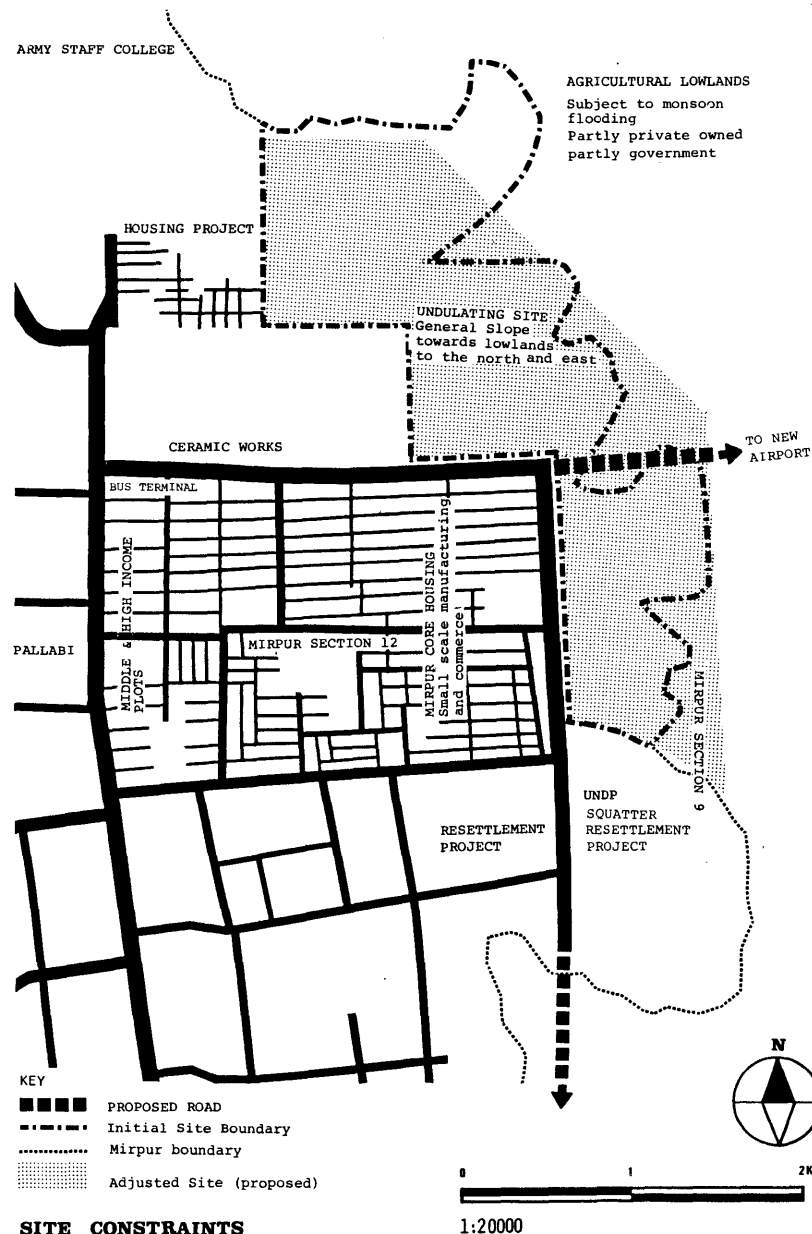
CIRCULATION



LAND USE



1: 50000



SITE CONSTRAINTS

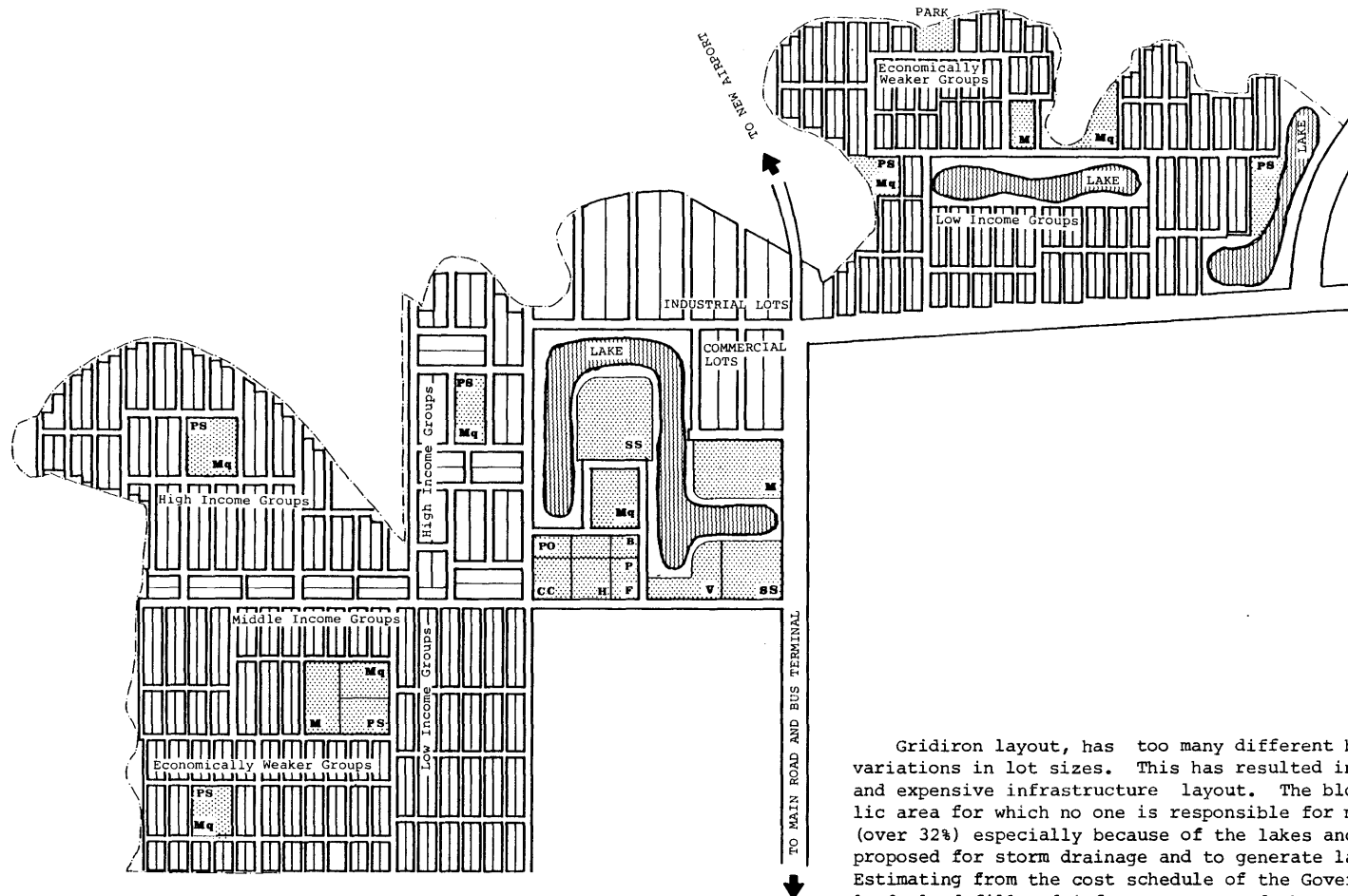
The site is at the north-eastern periphery of Mirpur and the existing boundaries are extremely irregular. While those at the south and west are defined by existing low income housing developments and cannot be modified, the boundary to the north and east are formed by low agricultural lands which are partly owned by the government and partly by private individuals. The site/boundary as shown in the government proposal is formed by the land titles acquired by the government in 1958. This boundary, particularly to the east and north is arbitrary in topographic terms and the degree of irregularity will result in a costly and inefficiently utilized land subdivision. The boundaries are proposed to be regularized as shown, so that a more efficient land subdivision and infrastructure layout is possible. Since the surrounding area is low a peripheral road will have to be constructed to secure the landfill and to serve as an embankment. A regular boundary will not only contribute to a lesser cost but also make demarcation and better linkages possible with the future developments which will invariably grow on the periphery as this housing project develops. This was seen in the boundaries of Mohammedpur where cooperative housing societies are putting in landfill to take advantage of its services.

A significant number of community facilities like schools, mosques and markets are already in adjacent housing developments which will benefit the new project. A bus terminal is about 1 Km. away from the site while another makeshift one which also serves private buses, mini-buses, auto-rickshaws is about 2 Km. away. It is believed that the makeshift terminal will shift towards the site as it develops.

The site has an undulating topography ranging in elevation between -3.5m to +12.8m. and will require about 3.7 million m^3 of landfill to raise the entire site above the highest flood level of +7.0m., in addition to cut and fill within the site. This has been estimated at TK. 144 million in the government proposal, about 50% of the total cost.

PROJECT PROGRAM

| | EXISTING | | PROPOSED | |
|--|-----------------|--------------|----------------------------------|--------------|
| TOTAL AREA | 100.0 Hectares | | 108.0 Hectares | |
| GROSS DENSITY - Assuming 1.5 families/lot | 515 Persons/Ha. | | 590 Persons/Ha. | |
| NET DENSITY | 918 Persons/Ha. | | 770 Persons/Ha. | |
| POPULATION | 51,489 | | 63,180 | |
| LAND UTILIZATION | | | | |
| PUBLIC (Streets, open spaces, lakes) | 32.6 Ha. | 32.8% | 15.7 | 14.5 % |
| SEMI-PUBLIC (Schools,community facilities) | 11.4 Ha. | 11.5% | 10.3 | 9.6 % |
| PRIVATE (Lots, cluster courts) | 56.0 Ha. | 56.0% | 82.0 | 75.9 % |
| TOTAL | 100.0 Ha. | 100.0% | 108.0 Ha. | 100.0% |
| UNIT CIRCULATION LENGTH | | | | |
| | 251 m/Ha. | | 134 m/Ha. | |
| RESIDENTIAL AREAS | | | | |
| Number of lots | 5721 | | 7020 | |
| Lot Dimensions | 3.0 x 15.2m | 12.8 x 18.3m | 3.0 x 15.0m | 9.0 x 21.0m |
| | 4.6 x 15.2m | 9.1 x 18.3m | 6.0 x 18.0m | 12.0 x 24.0m |
| | 7.6 x 15.2m | 13.7 x 18.3m | | |
| INDUSTRIAL AREAS | | | | |
| Number of lots | 75 | | ----- | |
| Lot Dimension | 18.3 x 36.3m | | | |
| COMMERCIAL LOTS | | | | |
| Number of lots | 40 | | 548 | 9.0 x 21.0m |
| Lot Dimension | 15.2 x 30.4m | | 12.0 x 24.0m | 6.0 x 18.0m |
| COMMUNITY FACILITIES: | | | | |
| Primary Schools | 7 | | 5 | |
| Secondary Schools | 2 | | 2 | |
| Vocational Training Schools | 1 | | 1 | |
| Health Centre, Bank, | | | | |
| Post Office, Fire | 1 each | | 1 each | |
| Services | | | | |
| Mosque | 7 | | 3 | |
| Market | 3 | | 3 | |
| DEVELOPMENT | | | Progressive, in stages | |
| TARGET INCOME GROUPS | | | Very Low, Low, Moderate and High | |
| | | | Very Low, Low, Moderate and High | |



KEY

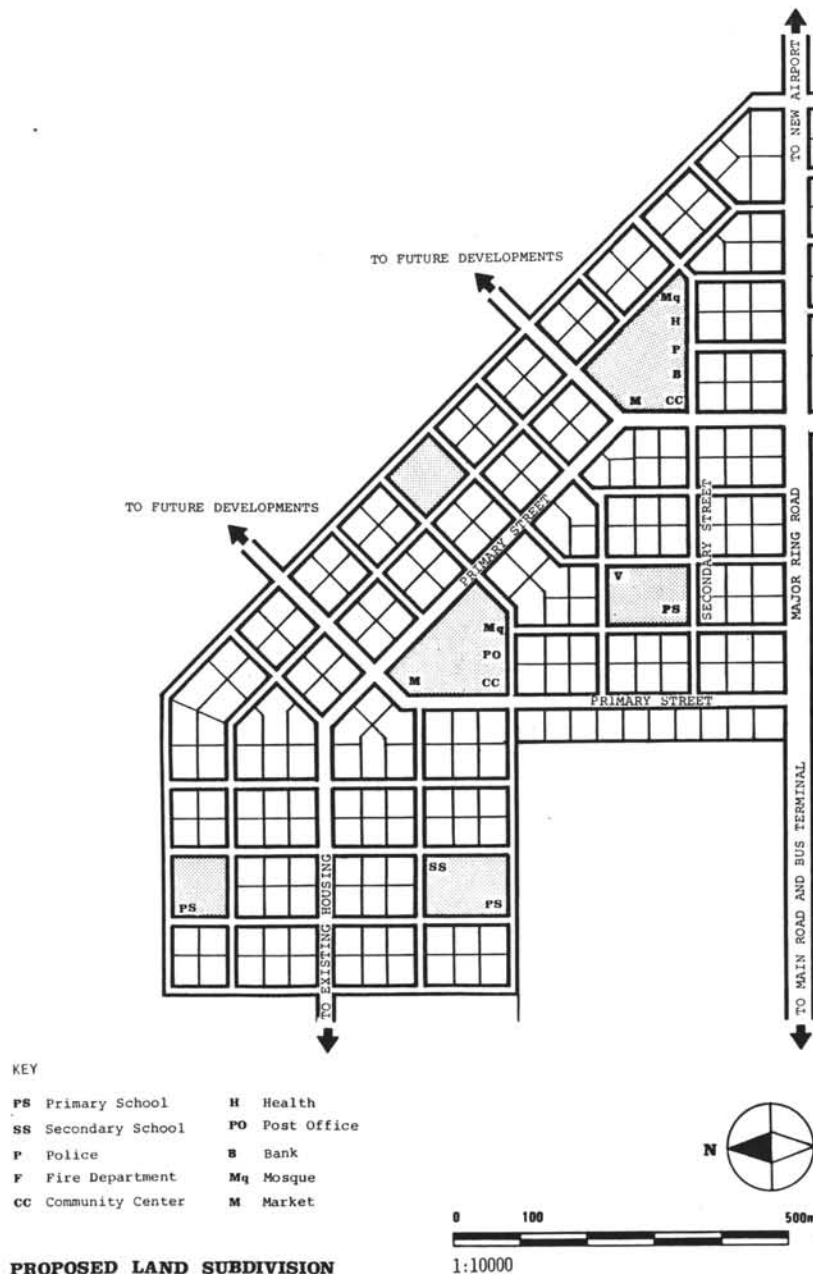
| | |
|---------------------|-----------------------|
| PS Primary School | V Vocational Training |
| P Police | B Bank |
| F Fire Department | |
| SS Secondary School | |
| CC Community Center | |
| B Bank | |
| Mq Mosque | |
| M Market | |
| H Health | |
| PO Post Office | |

EXISTING LAND SUBDIVISION



1:10000

Gridiron layout, has too many different block sizes because of the variations in lot sizes. This has resulted in inefficient circulation and expensive infrastructure layout. The blocks are very small, public area for which no one is responsible for maintenance is very high (over 32%) especially because of the lakes and open spaces, which were proposed for storm drainage and to generate land fill for the site. Estimating from the cost schedule of the Government project the cost of land, land fill and infrastructure and the proposed road to Airport was about Tk 2.8 mil/Ha. The minimum market value of the land in 1981 was approximately Tk 8.25 million which would go up sharply as soon as the proposed ring road is built. Thus for 16 Ha. of lake minimum revenue lost is over Tk 87.0 million, it would be much cheaper to fill in the land by bringing land from outside. Almost all community facilities provided at full subsidy are grouped in one place, by the main road, where the land value and the commercial potential is very high, again resulting in loss of revenue. Industrial and Commercial lots are separated and grouped together as if large Industries are expected. Roads are narrow (3m, 6m, 9m and 12m) compared to the areas served, and the hierarchy is not clear. Due to variations in block sizes the number of junctions and the network length is very high resulting in high costs.

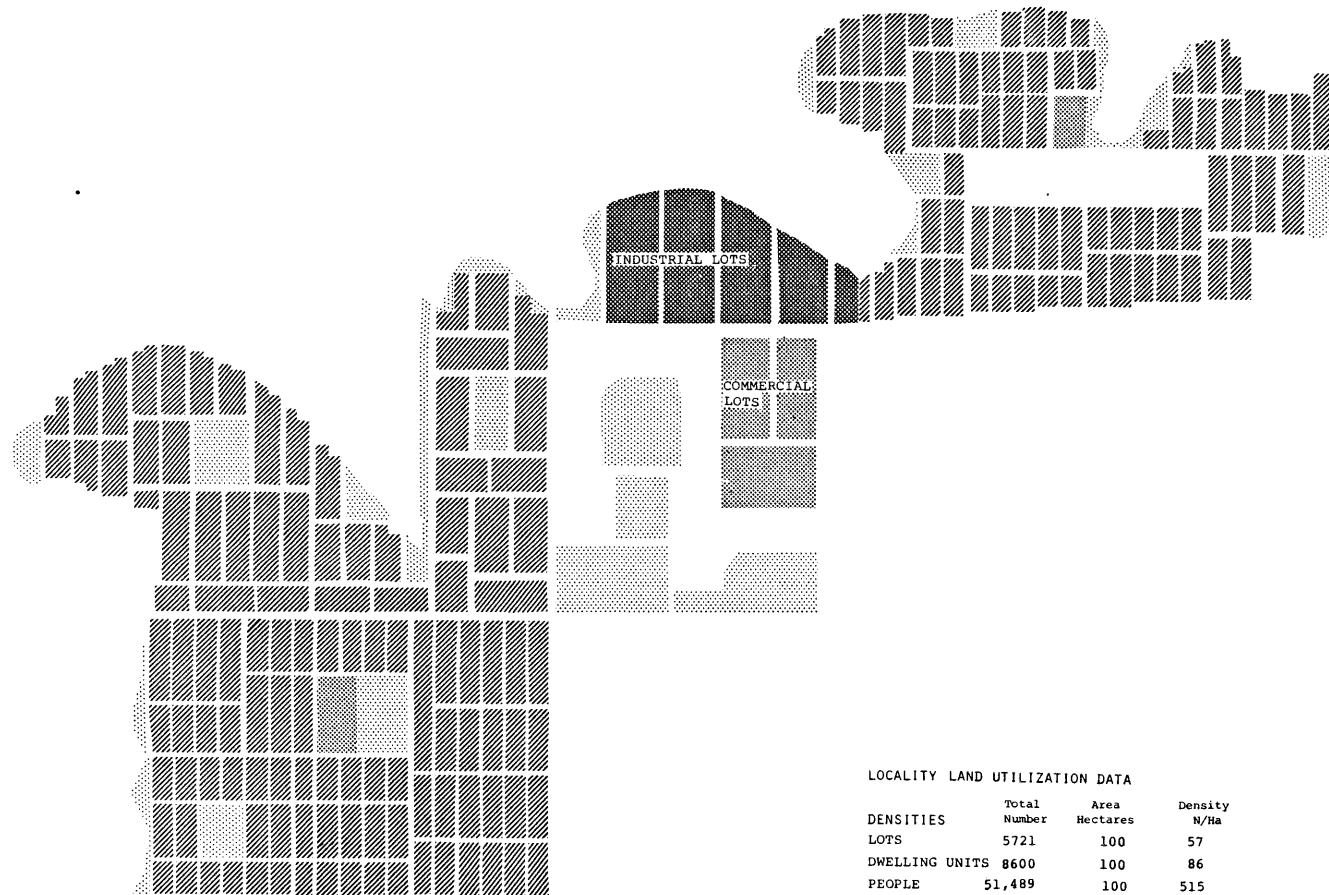


The layout is based on consideration of ease of access, clarity and efficiency of circulation. Only two road sizes are used 9m and 18m and roads are laid out in response to the shape, size and constraints of the site. Existing circulation and future extension of the system was a major determinant.

Grid layout is proposed because (a) It minimizes public land which has to be subsidized and maintained from public funds (b) Minimizes infrastructure network (c) Provides flexibility in land subdivision for future changes and independence of block-sizes from lot sizes (d) Promotes community growth and self-help within clusters and blocks.

Commercial activity will develop along the 18m wide primary street and the major ring road cutting through the site. This is boosted by the location of the community facilities. Larger lots for commercial uses to be sold at higher rates are placed along the major roads, the sizes and prices varying according to the potential land value.

Major streets have been laid out such that work can be started and such that the site can start functioning even before the site boundary has been regularised by negotiations.



AREAS

RESIDENTIAL

COMMERCIAL

INDUSTRIAL

OPEN SPACES



0 100 500m

1:10000

EXISTING LAND UTILIZATION

LOCALITY LAND UTILIZATION DATA

| DENSITIES | Total Number | Area Hectares | Density N/Ha |
|----------------|--------------|---------------|--------------|
| LOTS | 5721 | 100 | 57 |
| DWELLING UNITS | 8600 | 100 | 86 |
| PEOPLE | 51,489 | 100 | 515 |

| AREAS | Hectares | Percentages |
|---|----------|-------------|
| PUBLIC (streets, walkways, open spaces) | 32.47 | 32.47 |
| SEMI-PUBLIC (open spaces, schools, community centers) | 11.50 | 11.50 |
| PRIVATE (dwellings, shops, factories, lots) | 56.03 | 56.03 |
| SEMI-PRIVATE (cluster courts) | -- | -- -- |
| TOTAL | 100.00 | 100.00 |

NETWORK EFFICIENCY

Network length (streets, walkways) = 251 m/Ha
Areas served (total area)

LOTS

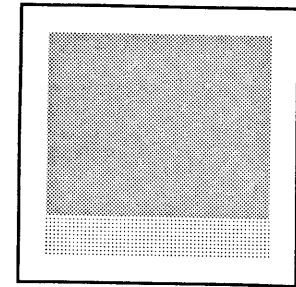
Average area, dimensions = 262 m²

Number of Commercial lots: 117

Area: 7.0 Ha

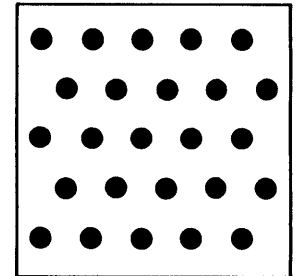
LAND UTILIZATION DIAGRAMS

1 Hectare



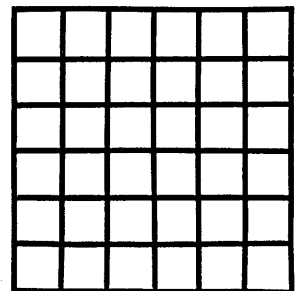
PERCENTAGES Streets/Walkways 32.5
Playgrounds 11.5
Cluster Courts --
Dwellings/Lots 56.0

1 Hectare



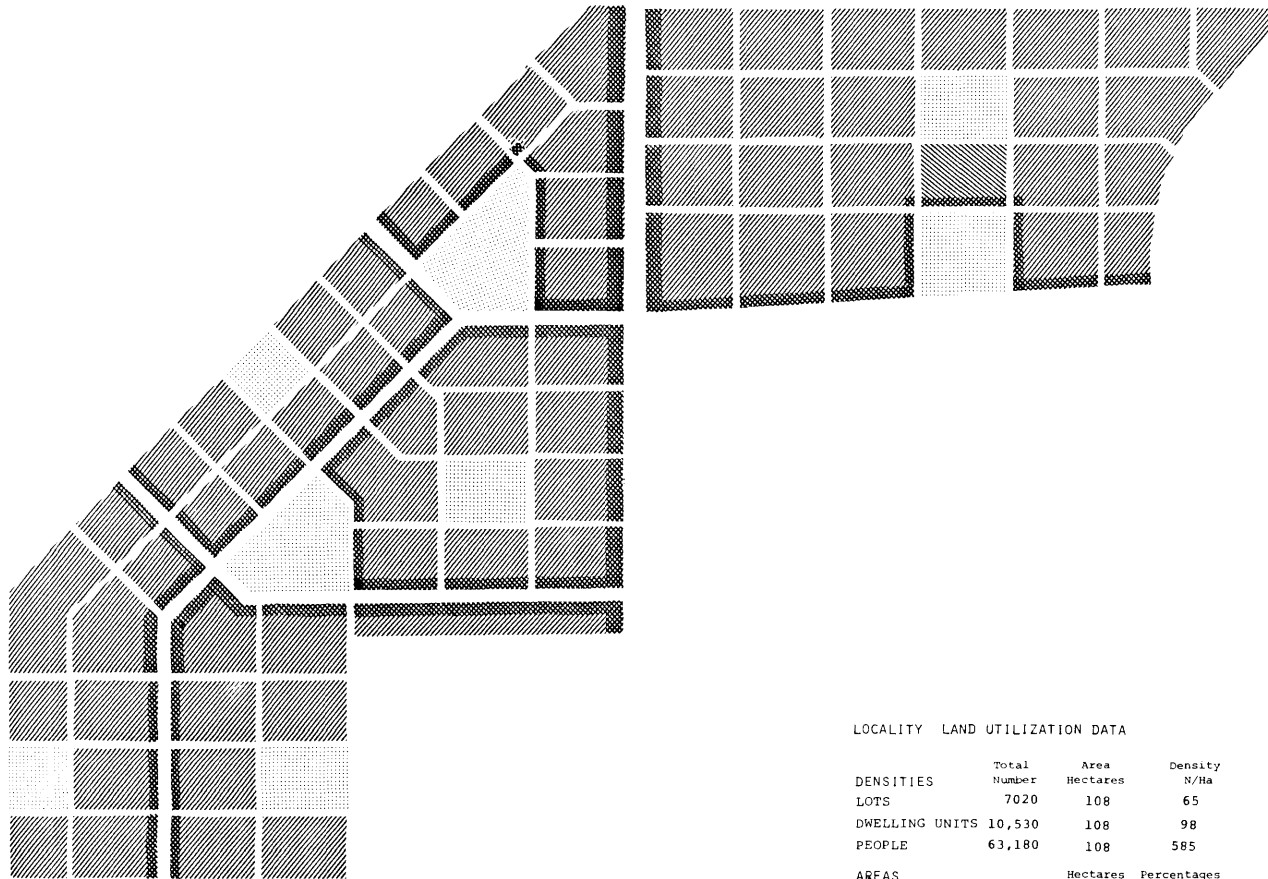
DENSITY Persons/Hectare 515
● 20 Persons

16 Hectares



CIRCULATION EFFICIENCY

length 251 m/Ha



PROPOSED LAND UTILIZATION

AREAS

RESIDENTIAL

COMMERCIAL

INDUSTRIAL

OPEN SPACES



0 100 500m

1:10000

LOCALITY LAND UTILIZATION DATA

| DENSITIES | Total Number | Area Hectares | Density R/Ha |
|----------------|--------------|---------------|--------------|
| LOTS | 7020 | 108 | 65 |
| DWELLING UNITS | 10,530 | 108 | 98 |
| PEOPLE | 63,180 | 108 | 585 |

| AREAS | Hectares | Percentages |
|---|----------|-------------|
| PUBLIC (streets, walkways, open spaces) | 15.7 | 14.5 |
| SEMI-PUBLIC (open spaces, schools, community centers) | 10.3 | 9.6 |
| PRIVATE (dwellings, shops, factories, lots) | 82.0 | 75.9 |
| SEMI-PRIVATE (cluster courts) | -- | -- |
| TOTAL | 108.0 | 100.0 |

NETWORK EFFICIENCY

Network length (streets, walkways) = 134 m/Ha

Areas served (total area)

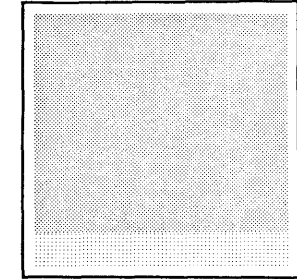
LOTS

Average area, dimensions = 158 m²

Number of Commercial lots: 548

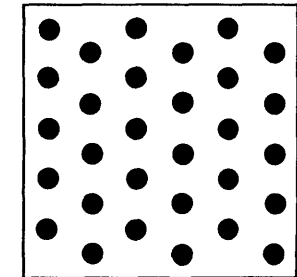
Area: 11.8 Ha

1 Hectare



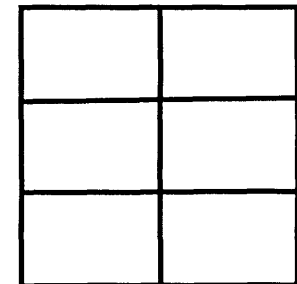
| | | |
|-------------|------------------|------|
| PERCENTAGES | Streets/Walkways | 14.5 |
| | Playgrounds | 9.6 |
| | Cluster Courts | -- |
| | Dwellings/Lots | 75.9 |

1 Hectare

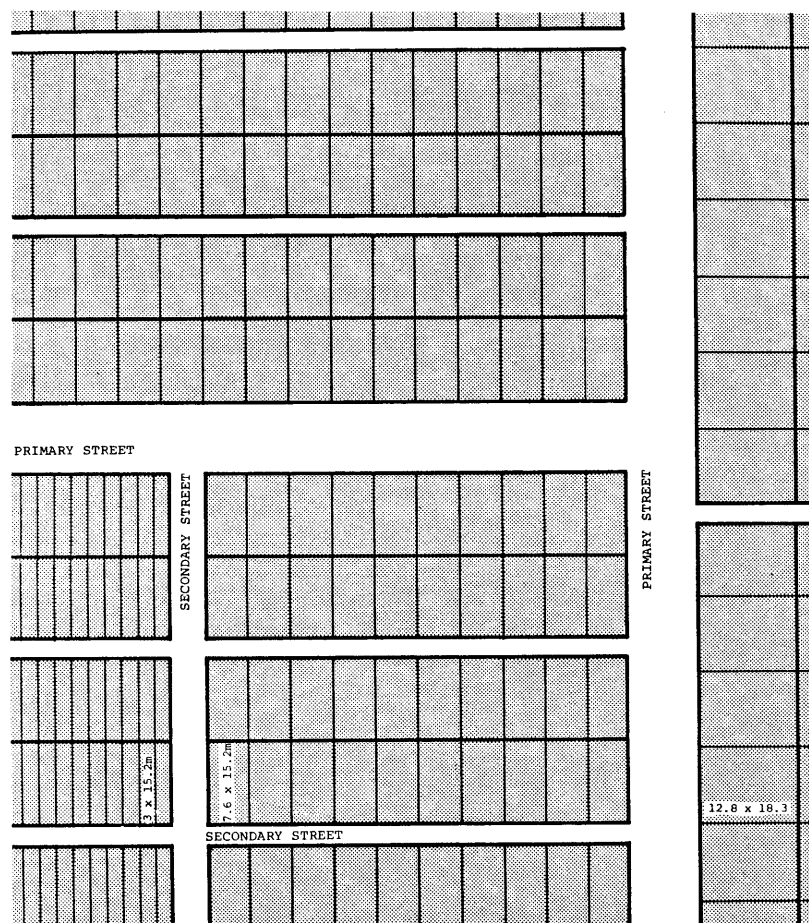


| | | |
|---------|-----------------|-----|
| DENSITY | Persons/Hectare | 585 |
| | 20 Persons | |

16 Hectares



| | | |
|------------------------|--------|----------|
| CIRCULATION EFFICIENCY | length | 134 m/Ha |
|------------------------|--------|----------|



PATTERN

Public: streets/walkways

Semi-Public: playgrounds

Semi-Private: cluster courts

Private: lots

dwellings



1:1250

EXISTING BLOCK

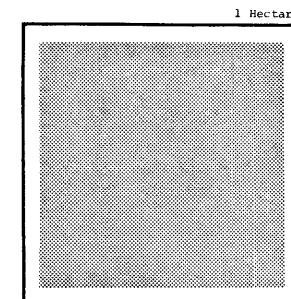
LOCALITY BLOCK LAND UTILIZATION DATA

| AREAS | Hectares | Percentages |
|---|----------|-------------|
| PUBLIC (streets, walkways, open spaces) | 0.52 | 20.8 |
| SEMI-PUBLIC (open spaces, schools, community centers) | -- -- | -- -- |
| PRIVATE (dwellings, shops, factories, lots) | 1.98 | 79.2 |
| SEMI-PRIVATE (cluster courts;-- | -- -- | -- -- |
| TOTAL | 2.50 | 100.0 |

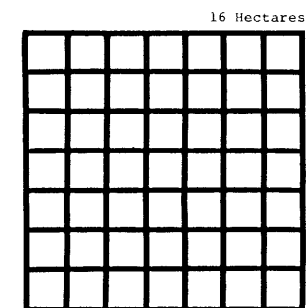
NETWORK EFFICIENCY

Network length (streets, walkways) = 356 m/Ha
 Areas served (total area)

LAND UTILIZATION DIAGRAMS



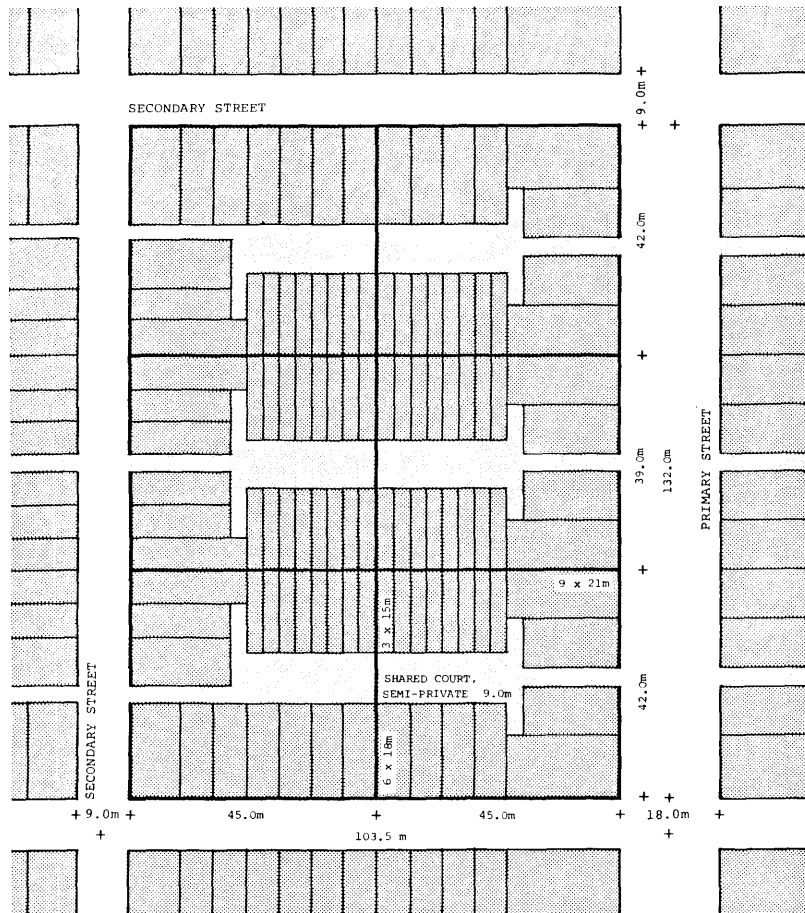
| | | |
|-------------|------------------|-------|
| PERCENTAGES | Streets/Walkways | 20.8 |
| | Playgrounds | -- -- |
| | Cluster Courts | -- -- |
| | Dwellings/Lots | 79.2 |



CIRCULATION EFFICIENCY

length 356 m/Ha

Blocks are of different sizes with a particular lot size forming each block. If we assume that larger block sizes are affordable to higher income groups and vice versa, as seen from the case studies, then this will segregate incomes. The whole site has been designed with a segregation of income groups, which hampers the growth of a harmonious community and is quite unusual in the traditional developments in Bangladesh.



PATTERN

Public: streets/walkways

Semi-Public: playgrounds

Semi-Private: cluster courts

Private: lots

 dwellings

0 10 50m

1:1250

PROPOSED BLOCK

LOCALITY BLOCK LAND UTILIZATION DATA

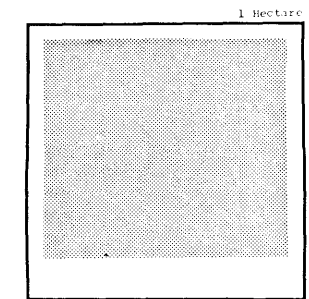
| AREAS | Hectares | Percentages |
|---|-------------|--------------|
| PUBLIC (streets, walkways, open spaces) | 0.67 | 27.0 |
| SEMI-PUBLIC (open spaces, schools, community centers) | -- | -- |
| PRIVATE (dwellings, shops, factories, lots) | 1.64 | 65.5 |
| SEMI-PRIVATE (cluster courts) | 0.19 | 7.5 |
| TOTAL | 2.50 | 100.0 |

NETWORK EFFICIENCY

Network length (streets, walkways) = 256 m/Ha

Areas served (total area)

LAND UTILIZATION DIAGRAMS

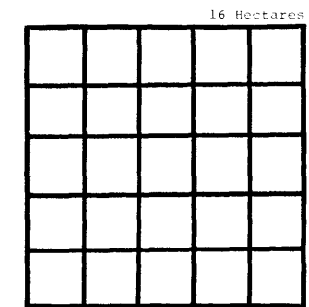


PERCENTAGES Streets/Walkways 27.0

Playgrounds --

Cluster Courts 7.5

Dwellings/Lots 65.5



CIRCULATION EFFICIENCY

Length 256 m/Ha

Blocks are laid out in grid of 90m x 123m except where site conditions impose restrictions. The size comes from case studies of existing settlements and is a compromise between costs of infrastructure and social interaction within the site.

Different lot sizes form the block and are located according to the potential for commercial use and land value. Lots at intersections and along the wider circulation routes are larger, similarly the lots at the periphery of the block are larger than those in the middle. This will facilitate differential pricing of lots such that the smaller plots can be cross subsidized to make them affordable to lower incomes.

Cluster courts are provided for access as well as for communal activities and is particularly useful in considering the very small size of the lots. Shared services necessary for reducing costs for the lower income groups will be placed in the cluster courts.

BLOCKS, CLUSTERS AND LOTS

Variations in lot sizes is reduced in the proposed design to 4 sizes, against the 9 in the existing design. The minimum lot size of 3 x 15m has been retained, but is augmented with shared cluster courts where household activity can extend, as is common in existing dwelling environments. The highest lot size in the existing project was for industrial plots which was 18.3 x 36.3m. But as seen in the case study and the study of the site context, it could be seen that the small industries commonly were in a very small lot. In Mirpur, they are in 7.5 x 15m plots, which includes a dwelling and a shop in front. The shop at the front is a necessary element as the manufacturers sell directly to individuals or to wholesalers who make periodic rounds to collect the products. These industries, because of their small scale and nature of operation, function better within the residential area, where the whole family and occasionally neighbors can help with the economic activities. Thus grouping the industrial or commercial lots separately has been avoided.

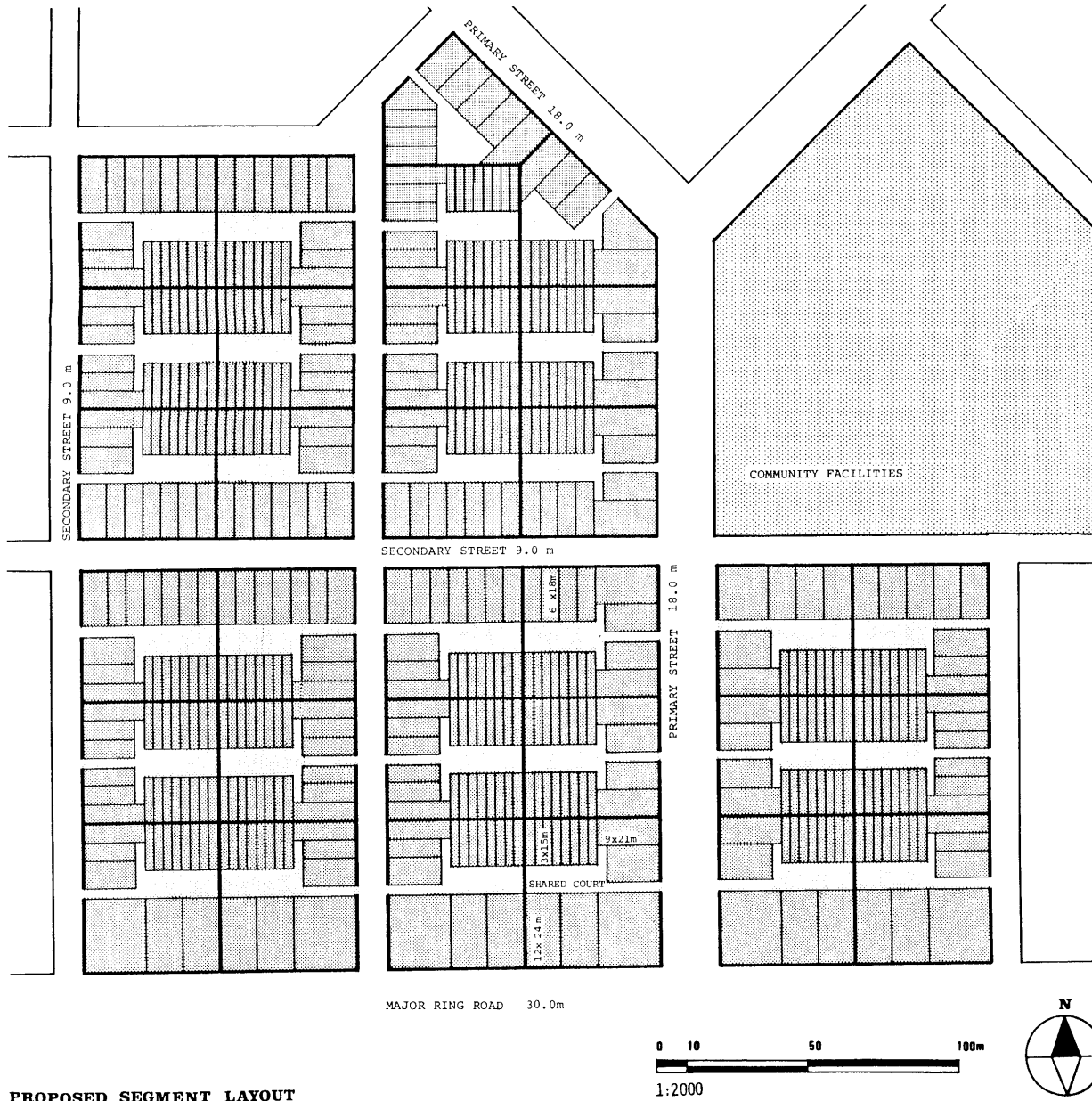
In the proposed design the largest lot size is 12 x 24m. In location, there was no distinction made between income groups or between different uses. Location of different uses is expected to be a natural process as a result of the layout. It has also been found in the case studies that commercial activity grows at certain advantageous locations and is difficult

to control by zoning. Pricing of lots would be determined according to the land values and the commercial potential of the lot. The land values of the lot are a function of the locational advantages within the site as well as within the whole site. The highest price would be along major roads and around community facilities.

The services would be provided and upgraded progressively. Priority would be placed on provision of paved streets, storm drainage, electricity and water supply. Pit privies and septic tanks would be the initial means of sewage disposal, and would be upgraded to conventional water borne sewage system as the community develops. Pit privies may be a health hazard because the high water table may become infected, particularly in the rainy season. But the risks can be minimized if adequate amounts of treated drinking water can be supplied. Shared services like latrines and community water taps will be provided in the cluster courts initially, for the lower income groups. These can be upgraded to individual connections later on, for those who can afford it.

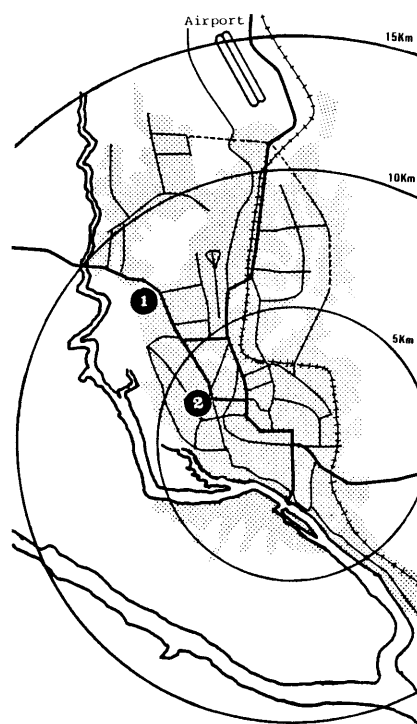
The socio-cultural characteristics regarding the number of people sharing services has been a major influence in deciding the number of lots per cluster. In keeping with community structure of existing dwelling environments, the number of lots that form a cluster has been designed between 15 to 20.

The project will have to be developed in stages, so that it is easier to manage for the public agency. This will also allow modifications in the layout and program as lessons are learned from the initial development.



APPENDIX

CASE STUDIES



DACCA: LOCATION OF CASE STUDIES

The case studies - 1. Mohammedpur and 2. Jhigatola - are both located in the western periphery of Dacca. Mohammedpur is a government sponsored core housing project which clearly displays the unique characteristics and achievements of popular participation in building a community. Identification of the transformation of this project after two decades of occupation and use was the goal, and was intended to give insights into the physical and policy issues relating to integration of public and popular resources.

Jhigatola has historically been informally developed and was selected to show the physical patterns as well as other characteristics of popular responses to the pressures of urbanization. The main focus of the case studies were documentation of the qualitative aspects and the process of housing, and how it varies between different population categories.



POPULAR HOUSING: Dramatic changes over original core within two decades. Those with public subsidized finance are instant developments, others grow incrementally with little progress beyond core, Mohammedpur (top). Traditional materials, forms, and rural habits seen in urban housing. Shared courtyard, services and narrow alleys make up most of Rayerbazar (bottom).

1 MOHAMMEDPUR, DACCA

LOCATION: The Mohammedpur housing estate is located in the north-western part of Dacca, five miles from the city center. The project is bounded to the east by the Capital Complex, and some informal growth, to the north by Lalmatia, a high and middle income residential area developed as a sister community to Mohammedpur, and to the north and west are low agricultural lands, where private entrepreneurs and housing societies are filling land parcels for new development.

The Dacca Aricha road connects Mohammedpur to the central city and also serves as the main link to the northern districts of the country. The site is accessible from the Mymensingh Road on the east, by-passing the Capital Complex. On the southwestern boundary, the Satmasjid Road and the Sarai-Jafrabad Road connect Mohammedpur to the informal business district, "Rayer Bazar", the adjacent high-income residential area, Dhanmondi and the shopping districts of New Elephant Road and New Market. The north and western part of the site is bordered by a 100 foot wide embankment and ringroad which is equipped with a sluice gate, to protect a part of the site from monsoon flooding.

BACKGROUND: In 1958, the government of East Pakistan undertook a massive countrywide housing scheme with 68,000 units at 19 sites in 14 districts, of what was then East Pakistan. The target population of these projects were the lower income groups, and the major component was core houses and serviced plots ranging in size from 120m² to 500m². In addition, there were low cost flats and a

considerable number of larger plots for the higher incomes. The main objective of the scheme was to house a large number of people displaced as a result of the Partition of India in 1947. Until then, these people were squatting on publicly owned urban land or living in overcrowded areas of the city, but invariably in unsanitary conditions and without most urban services. The refugee issue, especially their illegal status and the slum conditions, generated considerable political pressure, which was the main force behind these projects being taken up by the government at a time when the focus of public agencies was on development of housing estates with large plots for well to do beneficiaries. A new agency, "The Housing and Settlement Directorate" was created to implement the project, and they decided to rehabilitate the displaced people in planned townships in the outskirts of these cities where the refugees were located.

The layout plans were prepared by Government town planners who were assisted by experts from the U.N.

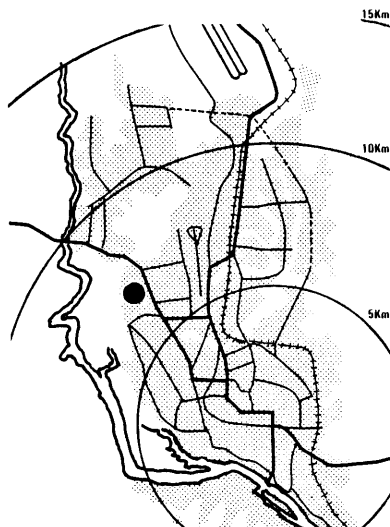
Mohammedpur, with an area of 170Ha, is one of the two sites in Dacca where this housing scheme was carried out, the other being Mirpur, with an area of 700Ha.

LAYOUT: Mohammedpur was laid out in a gridiron pattern and is divided by wide roads (18-23m) into six sections identified as "blocks A-F". Efficiency of utility layout and ease of circulation is not reflected in the layout.

Although the general program called for a mixed income community, the design largely segregated the income groups by placing only the

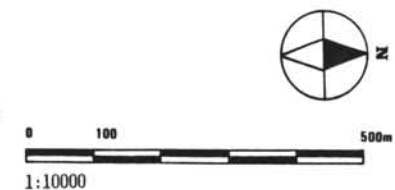
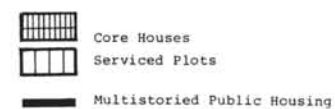
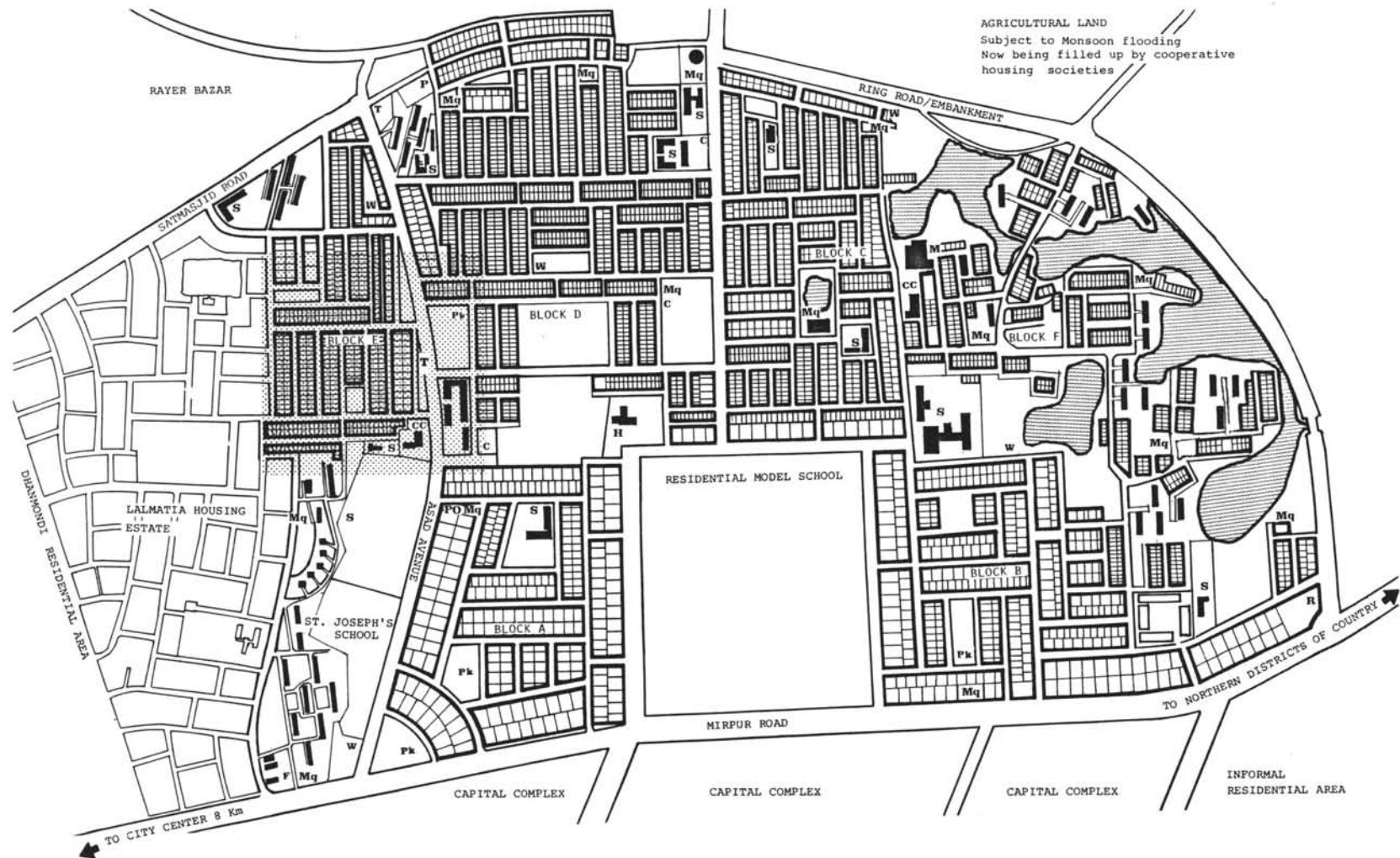
larger plots (i.e., those for the higher income groups) in sections A and B. Larger plots and the walk-up flats from the wider road on the periphery as well as within. This may have been done to make the abovesaid saleable plots more attractive to buyers, since the land for core houses was given free. This policy of differential pricing was not consistent throughout in design for determining locational advantages. The difference in price was only between saleable and non-saleable land, and not between locationally more advantageous ones. Most of the core housing units are located in blocks C, D, E and F.

Blocks of a wide range of sizes are formed by back to back plots, with all plots fronting public streets. The core houses/blocks range from 14-30 plots per block and there is a 4'-0" wide service alley in the interior of the block, which contains the utilities: sewers, water supply, gas and storm drainage.



CASE STUDY SOURCES

| | |
|-------------------------|--|
| Locality Plan: | (accurate) Housing & Settlement Directorate maps |
| Segment Plan: | (approximate) Air photograph, Survey of Bangladesh |
| Land Use Pattern: | (approximate) Field Survey, author 1981. |
| Block Plan: | (approximate) Field survey and Air photograph as above. |
| Typical Dwellings: | (accurate) Field Survey, author, Syed A. Moquit & Salimulla, 1981. |
| Photographs: | IBID |
| Background information: | Interviews with Housing & Settlement Directorate officials; Salaam, A. SELF HELP HOUSING EXPERIENCE IN BANGLADESH, unpublished Master's thesis at AIT, Bangkok, Hsanath, S.A. SITE & SERVICES SCHEMES IN DACCA: A CRITIQUE, 1981 |



PROJECT PLAN: Several general planning principles were adopted in the initial program, all of which could not be followed through in implementation.

With the aim of better social, political and economic integration, plots were to be distributed at a ratio of 60% to displaced families and 40% to local people. Although the primary focus was the low and middle income groups, a substantial number of higher income people were also housed in the projects. A mixture of housing types and sizes was provided to cater to different income groups.

To improve local economic conditions, and for future development, the sites were to be located at convenient distances from centers of employment.

A high population density was the target in order to distribute costs over a large number of people. Standard prototypes were used in the core houses to minimize overhead costs. Minimal construction was the goal to reach a maximum number of people within available resources. Therefore, only few essential community facilities (like primary schools, health centers and shopping centers) were provided, and spaces were set aside for mosques, high schools, colleges and other facilities.

A cross subsidization scheme was developed to make the program self-financing. It included selling the larger plots to the high and middle income groups at a higher rate (but lower than market rates) and selling commercial and industrial plots at auction. The funds raised thus were used to defray the cost of land needed for the core houses.

To reduce the cost of houses and improve the quality, a Housing and Building Research Institute was established with the primary objective of improving and developing building materials and methods of construction.

PROJECT PROGRAM: A mixture of housing types and plot sizes was provided in Mohammedpur, including 2,292 core houses, 402 flats and 1,600 serviced plots. The flats range in size between 18.6m² to 55.8m², 288 being one room, 90 two rooms, and 24 with three rooms. The plots range in size from 120m² to 835m². Two types of core units were provided, which varied according to the size of the plot, the built-up area and repayment schedules. All units/plots had access to basic services like paved streets, electricity, piped water supply, sewer, waste water and garbage disposal. Subsequently, they were provided with gas connections.

Of the two types of core houses, units of one were detached (type A) and of one were semidetached (type B), with the expectation that they would be expanded by the tenants both horizontally and vertically. The attempts to make the units affordable to the target population led to the use of sloped concrete ribbed slabs and walls. To save costs, the foundation capacity did not allow vertical expansion. These measures proved to be self-defeating to the concept of expandable cores, since in all units interviewed, the core was found to be more of a hindrance to expansion and adjustment than help. In type B, the attached units had a sloped core roof, which due to structural requirements could not even be

broken down without endangering the adjacent structure, thus limiting independent expansion of the unit.

The cost of the core unit, type A, with a plot size of 7.9m x 15.3m was fixed at Tk 2600 and were allotted with a downpayment of Tk 200 and monthly instalments of Tk 200 for 10 years. The smaller core units, type B, with a plot size of 7.3m x 15.3m were sold at Tk 2520, but at an easier repayment rate of Tk 14 spread over 15 years.

Monthly income of the low-income group was assessed to be under Tk 200 per week with a majority being in the 75 Tk to 150 Tk bracket. Therefore, it was assumed that a family of this group cannot invest more than 2 years of its income in housing, i.e., approximately Tk 3000. This formed the basis for providing the particular size of the units.

Community facilities provided consisted of two primary schools, a health center, two markets with a total of 100 shops and two community centers. These had masonry walls and concrete roofs and followed high quality specifications. Spaces were set aside for future development through the initiative of the people or other government agencies for one more primary and four high schools, a post office, a gasoline station, a police outpost, a bus terminal, 14 mosques, a cinema, a madrasa and an eedgah, for the annual congregations during Eid Festivals.

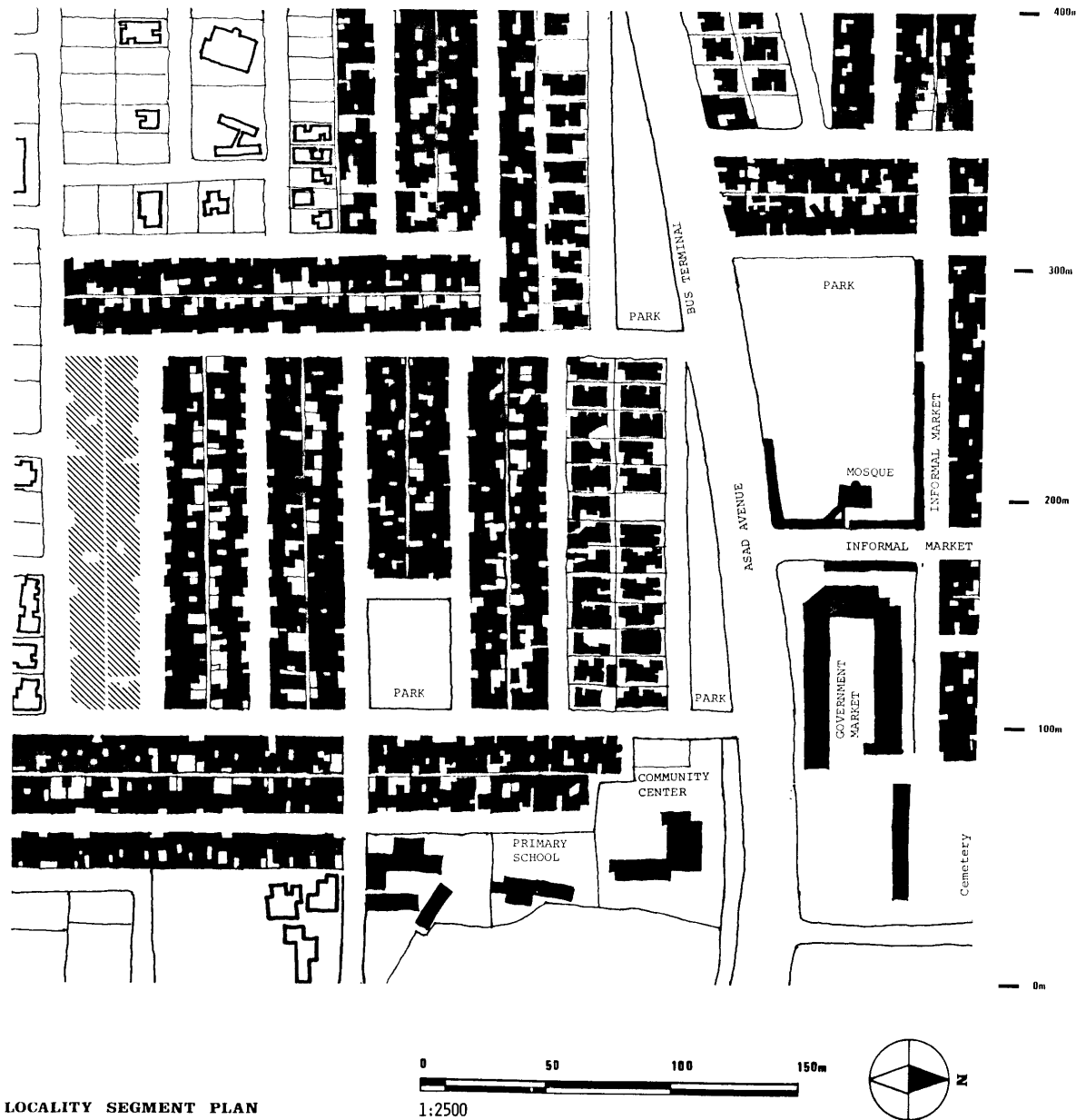
A small number of larger plots earmarked for industrial uses were located in the western periphery of the projects. Some lowlying areas were left as open spaces which served as natural drainage for a part of the site.

POPULATION: One study in 1978 puts the number of households in the area of about 10,000 with an average family size of 7 persons. Many households consist of extended families which makes the occupancy rate very high. Many houses have rooms rented out and thus add to the density. The study also found the density in the core housing section of Mohammedpur to be about 750 P/Ha. Although the average density for Mohammedpur areas was lower. One of the case study dwellings was occupied by an extended family of 32 members spanning 3 generations and had 5 married couples and 20 of their children ranging in age from 6 months to 20 years.

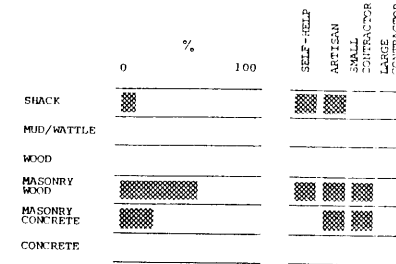
The population of Mohammedpur shows a wide range of occupation and income levels, but after the Independence of Bangladesh proportionately more higher income people came to replace those who had emigrated to Pakistan - several studies put this figure of emigration from Mohammedpur to about 40%. This shift towards a higher income population was due to the growth of the city and population pressures, but the mechanisms may have been legal or extralegal. Incomes generally range from lower middle to upper middle in the core houses and upper middle to high in the other plots.

The languages spoken and cultural background of the inhabitants also varies considerably with a substantial number of individuals Urdu speaking "Biharis" or migrants from Bihar. Most of the residents are educated and a good number of them are professionals such as doctors, engineers and lawyers.

A majority of the people are employed in government or semi-government organizations and the



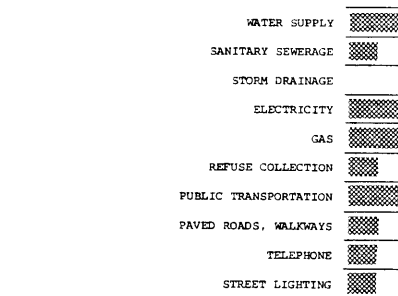
LOCALITY CONSTRUCTION TYPES



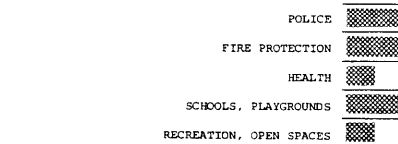
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



LOCALITY COMMUNITY FACILITIES



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

[Pattern] SELECTED BLOCK

rest are engaged in small scale trading, business and manufacture. A large number of shops and businesses are owned and operated by the resident family members, and in cases with some hired help. As the income goes down, all the members of the household can be seen to get involved with income producing activities, even those with regular income helping with part time jobs. Housewives take in sewing, and often very young children can be seen selling cane or cookies or helping run the family shop. Rentals provide additional income which, in few cases studied was more than triple the regular income of the household head. Other activities like planting vegetable gardens and raising chickens, pigeons, goats and even cows can be seen in the courtyards and spaces around the home.

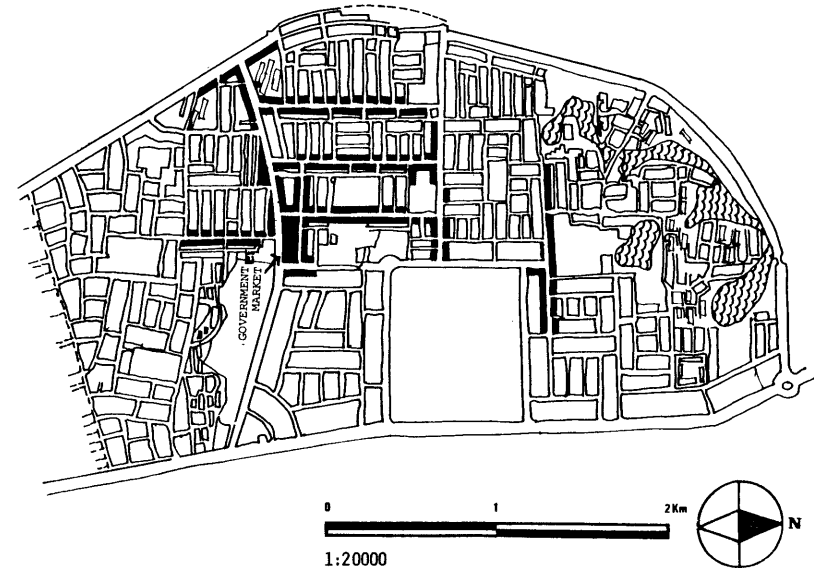
CIRCULATION, TRANSPORTATION AND COMMERCE: A 75 foot wide road, Asad Avenue, runs through the southern half of the site, connecting the two main roads at its boundaries. It carries the heaviest traffic within the site. A number of community facilities are located along the road, including a community center, a government market, government bus terminal, and public parks and open spaces. Some open spaces are clearly spaces left over from the configuration of the roads and the rectilinear layout of the plots. A network of secondary roads provides for internal circulation with 60' and 40' wide roads serving as main avenues and 30' wide roads giving access to the units. The commercially valuable open spaces are being used for motor workshops, shopping, a makeshift busstand, and

for low-cost restaurants, all illegal. (But of course this is a better use than uncared for open space.)

Public transportation services connect the housing estate to the city through the Dacca-Aricha road and the Asad Avenue. The bulk of the population living in sections C, D, E, and F have to go to one of these main roads for transportation. This has resulted in the movement of a larger volume of traffic between the northern and the southern part and has generated commercial development along both sides of the streets connecting those parts. The activity generated has congested the streets and impeded the flow of traffic. These roads are 40m wide and inadequate for traffic and activity. The access roads have been made 30m wide - where hardly anyone owns a vehicle - and encroachment by residents is noted in a number of places.

The development of viable transportation networks of buses, autorickshaws, rickshaws and pushcarts catering to the needs and capacities of different income levels, is one of the reasons of the success of Mohammedpur as a residential area. they compliment each other in transporting goods and people within the site as well as to other parts of the city. Although a large part of the site is not within walking distance from bus routes, rickshaws help to distribute people and also carry small parcels. The rickshaws and autorickshaws also form a network linking Mohammedpur with many different areas of the city, while the pushcarts take care of the bulk goods.

The success of the government mar-



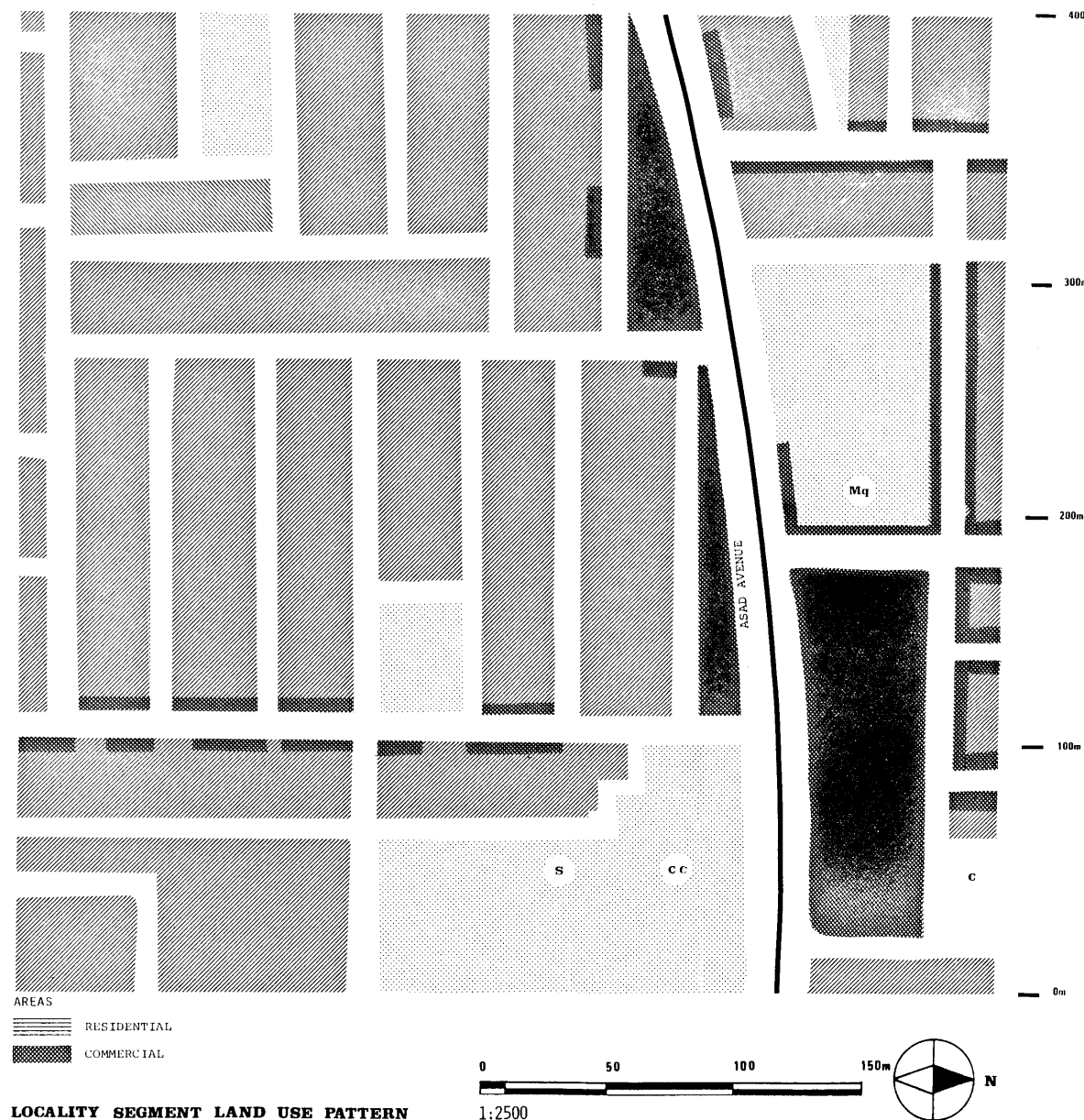
NEW COMMERCIAL DEVELOPMENT IN MOHAMMEDPUR

ket on Asad Avenue and the clustering of bus, rickshaw and pushcart terminals seems to indicate a symbiotic relationship between transport and commerce. Apparently, this property can either be strengthened and utilized or prevented by the circulation and layout, as can be seen by the unsuccessful existence of the other market.

LAND USE PATTERN: Mohammedpur is predominantly a residential area, but also with a large number of commercial establishments. The project was initially designed with blocks designated for specific land uses like residential, commercial, community facilities, open spaces, parks, industrial, etc. But when

built, service oriented trades, and small scale manufacturing began to appear throughout the project. These small shops included general stores, stationers, confectioners, tailors, and embroiderers, barbershops, shoe makers and electrical and mechanical repair shops. Apart from these, there are also a large number of shops dealing in clothes, fruit, vegetables and groceries which have developed informally and in most cases illegally around the government market.

These new informal commercial uses have developed in a ribbon form along streets on public as well as private land, especially along the longer streets which carry more traffic because of their location. Commercial establishments, including restaurants, motor workshops,



bus terminals and push cart stands have appeared in the spaces reserved for parks at important locations. Where the open spaces are not commercially feasible, they have been occupied by squatters.

Community facilities have grown as well. At present, Mohammedpur has 5 kindergartens, most of them housed in residential buildings, 8 primary schools, 7 secondary schools, 12 mosques, 2 clinics, a cinema and 2 markets - of the two markets, one is a wholesale vegetable market built recently by the government which is supplied by adjacent rural areas. Another government market failed and is now occupied by refugees, waiting to be repatriated to Pakistan. The refugees also occupy the two community centers and their compounds in addition to a few acres of unbuilt land in Section B.

Two large schools, one of the residential and the other a Catholic mission high school, which serves the elite and richer sections of Dacca population, occupy about 1/8 of the total area of Mohammedpur, and at the best location from a commercial standpoint.

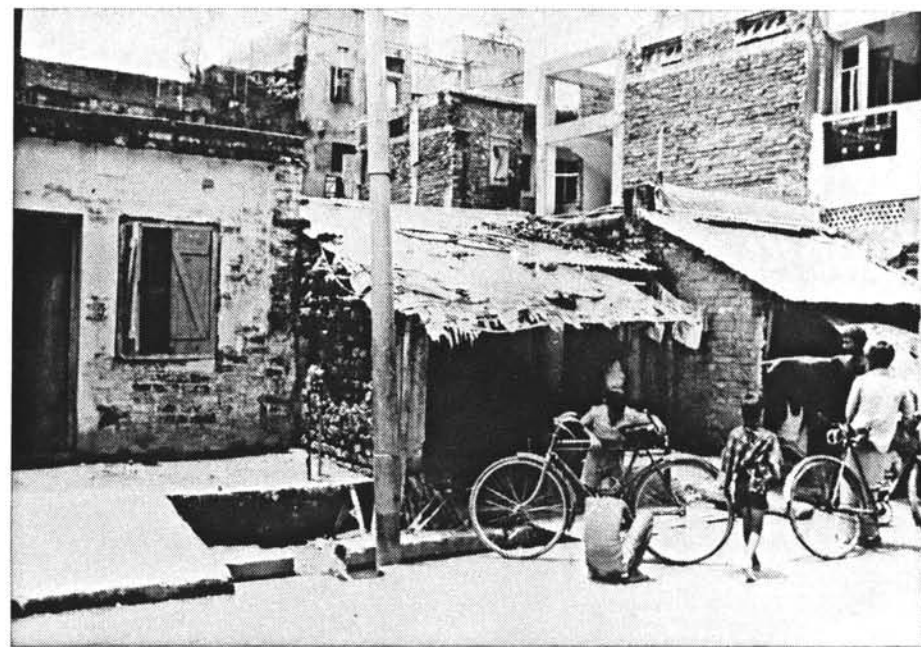
Mohammedpur also draws upon the parallel development of urban facilities at the boundaries, for example, the three large hospitals at the Capital Complex across the road.

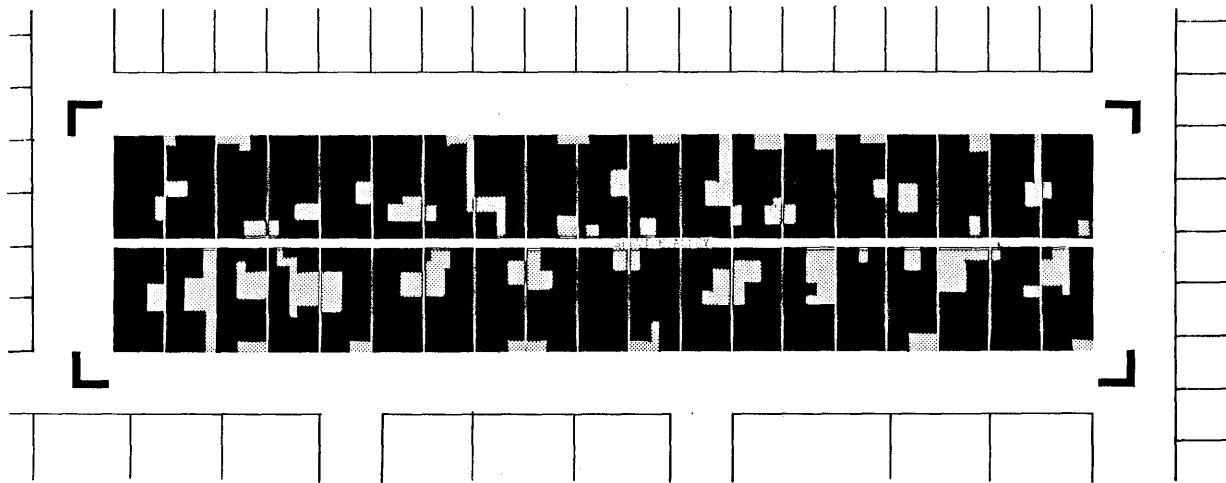
KEY

- S School
- CC Community Center
- Mq Mosque
- M Market
- C Cemetery
- Bus Auto Tempo Service



INFORMAL SHOPPING, MOHAMMEDPUR: Flourishing illegal shops just outside government market. Minimum expenditure on superstructure allows competitive pricing. Selling sandals (left) vegetables and grocery (top). Initial stages of shopping growth, renting to bicycle repairer allows owner to expand core unit. Incremental construction in the background over core.





LOCALITY BLOCK LAND UTILIZATION DATA

| DENSITIES | Total Number | Area Hectares | Density N/Ha |
|--|-----------------|------------------|-----------------|
| LOTS | 38 | 0.66 | 58 |
| DWELLING UNITS | 96 | 0.66 | 129 |
| PEOPLE | 684 | 0.66 | 1036 |
| AREAS | | Hectares | Percentages |
| PUBLIC (streets, walkways, open spaces) | | 0.20 | 30.3 |
| SEMI-PUBLIC (open spaces, schools, community centers) | | -- | -- |
| PRIVATE (dwellings, shops, factories, lots) | | 0.46 | 69.7 |
| SEMI-PRIVATE (cluster courts) | | -- | -- |
| TOTAL | | 0.66 | 100.0 |

NETWORK EFFICIENCY

Network length (streets, walkways) = 827.0 m/Ha*
 Areas served (total area)
 *603 m/Ha without service alley

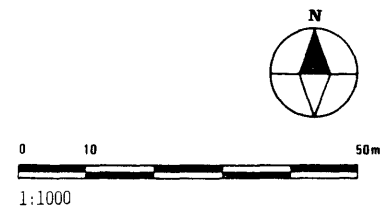
LOTS

Average area, dimensions = 114 m²

PATTERN

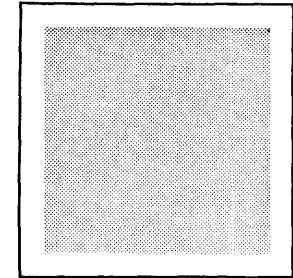
| | | |
|---------------|------------------|--|
| Public: | streets/walkways | |
| Semi-Public: | playgrounds | |
| Semi-Private: | cluster courts | |
| Private: | lots | |
| | dwellings | |

LOCALITY BLOCK LAND UTILIZATION



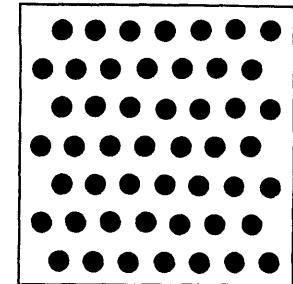
LAND UTILIZATION DIAGRAMS

1 Hectare



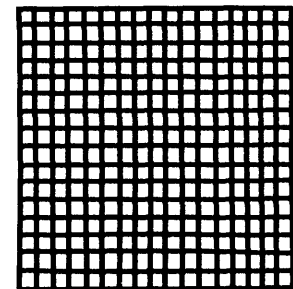
PERCENTAGES Streets/Walkways 30.3
 Playgrounds --
 Cluster Courts --
 Dwellings/Lots 69.7

1 Hectare



DENSITY Persons/Hectare 1036
 ● 20 Persons

16 Hectare



CIRCULATION EFFICIENCY

Meters/Hectare 827

DWELLINGS: Along with the development of the general area, all the core houses have also undergone modifications through additions, alterations or both. 60% of them had undergone major additions and alterations until 1978 with many demolished and replaced. These houses can be classified into two groups according to their degree of transformation: 1) improved units and 2) new units.

IMPROVED UNITS: In about 33% of the total units, the expansion is made in stages. Using semipermanent or permanent materials, they start with low priority improvements, for example, bamboo mat, tin and then use more permanent materials like masonry walls and reinforced concrete roofs. These incremental improvements are financed by each family outside of the formal financial structures. The structural additions are made for both living and commercial uses but in most cases for renting. Additions seldom are a result of an increase in the family size, but are undertaken as investments to obtain extra rental income from rooms or shops. Once rented, the dwelling becomes a multifamily unit, sharing a small courtyard space and latrine, but seldom the kitchen. In all of the improved units studied, there was one enclosed latrine which was provided initially, and a semi-enclosed space for a bath, which was shared by all dwellers of the unit. Privacy is maintained by a combination of custom and, where necessary, by physical barriers. Community enforcement of the social codes is quite strong. Construction is generally by hired masons and laborers with supervision and occasional help from the owner's family members. All aspects of procurement of materials and transportation is managed by the owner.

NEW UNITS: These comprise about 27% of the total core houses. They represent the so-called instant type of developments with the use of permanent materials, i.e., masonry and concrete. They are generally financed from subsidized public loans. Construction activity is essentially similar to the improved units with owner supervision and hired help. Generally, there is one family per floor as is customary with higher incomes, but exceptions have been observed where 2 families share a flat.

FACTORS FOR DEVELOPMENT: The factors affecting development in Mohammedpur are partly external and partly built into the design decisions. Taken together these give an idea of the factors that can make for a successful housing project.

a. **Location:** The expansion of Dacca brought Mohammedpur well within the city, thus raising the value of land and units. The surrounding development (the adjacent Capital Complex, Dhanmondi and Laumatia high income residential areas, Rayer Bazar informal district and the recent cooperative housing developments) also brought about a rise in land values and improved services.

b. **Transportation:** Development of a good transportation network linking Mohammedpur to the center as well as other areas of the city contributed to the success of Mohammedpur. Two bus routes, including an express service originate in Mohammedpur. It is also within the reach of pedal rickshaws which are the backbone of the transportation system of Dacca.

c. **Employment:** The growth of tanneries and small manufacturing at Rayer Bazar and in the surrounding developments, provided employment to the residents. Also the proportion of high to low income groups significantly influenced the development of service-oriented trade and commerce.

d. **Change of Ownership:** A large number of core houses and plots exchanged hands legally or otherwise in 1971 when 39% of the non-Bengalis among the original occupants migrated en-masse to Pakistan due to the independence of Bangladesh. The new owners invariably undertook some construction to consolidate their ownership. (In case of serviced plots, the terms

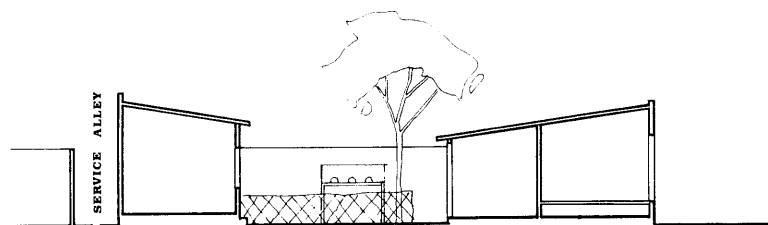
of lease stipulated that some sort of habitable unit should be there to effect legal change of ownership. This prompted the bulk of construction.) The change of ownership brought in people mainly from the higher income because the land value of the area was already quite high and due to the clandestine nature of transactions only people with ready cash and links with the "new powers" could buy these houses.

e. **Indirect Factors:** In a case study of Mohammedpur in 1978, a correlation was found between the development of units and several key factors. Locational advantages, availability of public financing, income and education and age of the household head. (1)

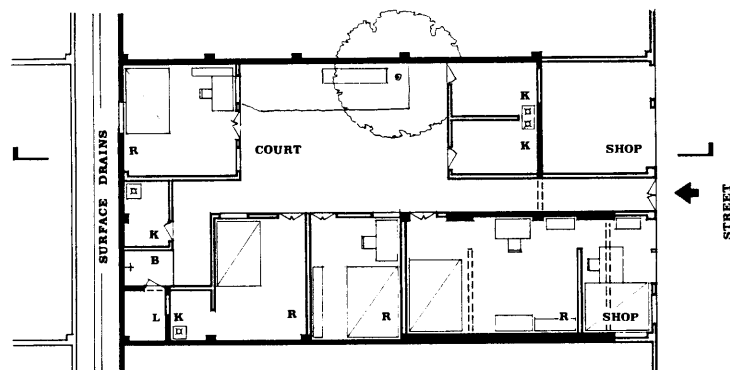
A quick visual survey of Mohammedpur confirms the influence of locational advantages to the level of improvement. Proximity to public transportation routes, main roads, markets, community facilities and open spaces allow corner lots to be among the first to develop.

In the case of financing, units assisted by public finance tend to be built all at once, those without are built incrementally.

The age and income of the household head are related and point out the necessity of more space as a person ages due to family growth but also because the income usually increases with age. The occupation and education of the household head influences not only income but also provides the skills needed to surmount legal and financial hurdles. It also establishes confidence in the loan agencies, suppliers, and subcontractors.



SECTION



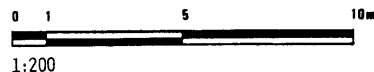
PLAN

KEY

- R Room (multi-use)
 K Kitchen/Cooking Area
 B Bath
 L Latrine

- Original Core
 Additions
 Demolitions

TYPICAL DWELLING
 MODIFIED CORE



PHYSICAL DATA
 (related to dwelling and land)

| | |
|-----------------------|----------------------------|
| DWELLING UNIT | |
| type: | ROOMS |
| area (sq m): | 14 |
| tenure: | LEGAL, OWNERSHIP/RENTAL |
| LAND/LOT | |
| utilization: | PRIVATE |
| area (sq m): | 116 |
| tenure: | LEGAL, OWNERSHIP |
| DWELLING | |
| location: | PERIPHERY |
| type: | ROW |
| number of floors: | ONE |
| utilization: | MULTIPLE, FAMILY |
| physical state: | FAIR |
| DWELLING DEVELOPMENT | |
| mode: | INCREMENTAL |
| developer: | POPULAR |
| builder: | SELF-HELP, ARTISAN |
| construction type: | MASONRY-WOOD |
| year of construction: | CORE 1958, ADDITIONS SINCE |
| MATERIALS | |
| foundation: | MASONRY |
| floors: | CEMENT, MUD |
| walls: | BRICK |
| roof: | CORRUGATED IRON, CONCRETE |
| DWELLING FACILITIES | |
| wc: | 1 |
| tap: | 1 |
| kitchen: | 4 |
| rooms: | 4 |
| other: | 2 SHOPS, COURT (Shared) |

SOCIO-ECONOMIC DATA
 (related to user)

| | |
|-----------------------------|--------------------------------|
| GENERAL: SOCIAL | |
| user's ethnic origin: | BIHARI |
| place of birth: | BIHAR, INDIA |
| education level: | PRIMARY SCHOOL |
| NUMBER OF USERS | |
| married: | 8 |
| single: | 1 |
| children: | 14 |
| total: | 23 |
| MIGRATION PATTERN | |
| number of moves: | 2 |
| rural - urban: | 1 |
| urban - urban: | 1 |
| urban - rural: | - |
| why came to urban area: | PARTITION OF INDIA |
| GENERAL: ECONOMIC | |
| user's income group: | LOW/MODERATE |
| employment: | SELF-EMPLOYED ON-SITE |
| distance to work: | - |
| mode of travel: | BUS |
| COSTS | |
| dwelling unit: | CORE \$700(1958); \$5300(1981) |
| land - market value: | \$9,500(1981) |
| DWELLING UNIT PAYMENTS | |
| financing: | SELF |
| rent/mortgage: | \$60 DOWN, \$5.7/MONTH(1958) |
| % income for rent/mortgage: | 15% APPROXIMATELY |

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
 type: HOUSE, JOINT FAMILY
 area (sq m): 102
 tenure: LEGAL, OWNERSHIP

LAND/LOT
 utilization: PRIVATE
 area (sq m): 116
 tenure: LEGAL, OWNERSHIP

DWELLING
 location: PERIPHERY
 type: ROW
 number of floors: ONE
 utilization: MULTIPLE, FAMILY
 physical state: FAIR

DWELLING DEVELOPMENT
 mode: INCREMENTAL
 developer: POPULAR
 builder: SELF-HELP, ARTISAN
 construction type: MASONRY-WOOD
 year of construction: CORE(1958), ADDITIONS SINCE

MATERIALS
 foundation: MASONRY, WOOD POSTS
 floors: CEMENT, MUD
 walls: BRICK, BAMBOO MAT
 roof: CONCRETE, ASBESTOS, CORRUGATED IRON

DWELLING FACILITIES
 wc: 1
 tap: 1
 kitchen: 1
 rooms: 5
 other: 2 SHOPS, COURT

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
 user's ethnic origin: BIHARI, INDIA
 place of birth: BIHAR, INDIA
 education level: HIGH SCHOOL, TECHNICAL TRAINING

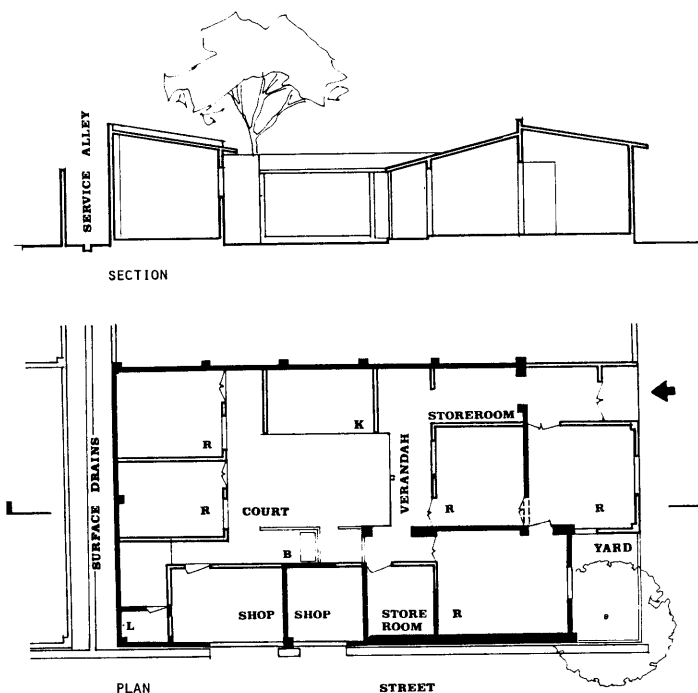
NUMBER OF USERS
 married: 10
 single: 2
 children: 20
 total: 32

MIGRATION PATTERN
 number of moves: 1
 rural - urban: -
 urban - urban: 1
 urban - rural: -
 why came to urban area: PARTITION OF INDIA

GENERAL: ECONOMIC
 user's income group: LOW/MODERATE
 employment: SERVICE, BUSINESS
 distance to work: 8 Km
 mode of travel: BUS

COSTS
 dwelling unit: CORE \$700(1958), \$5000(1981)
 land - market value: \$9,400(1981)

DWELLING UNIT PAYMENTS
 financing: SELF
 rent/mortgage: OUTRIGHT PURCHASE
 % income for rent/mortgage: -



KEY

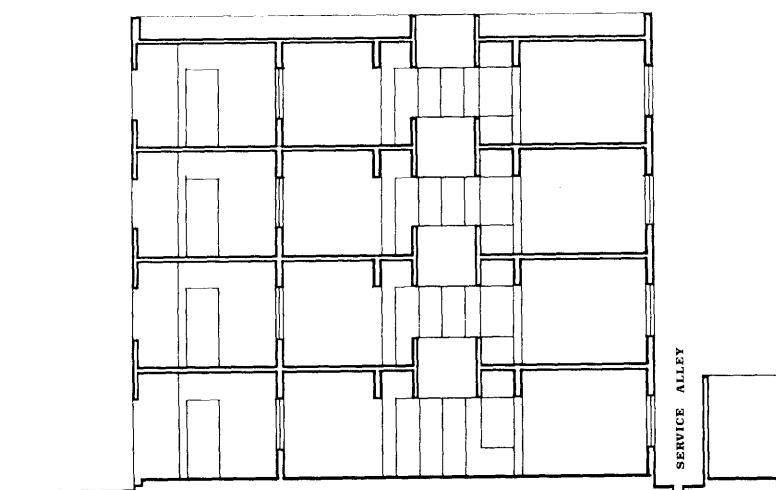
R Room (multi-use)
 K Kitchen/Cooking Area
 B Bath
 L Latrine
 Original Core
 Additions
 Demolitions



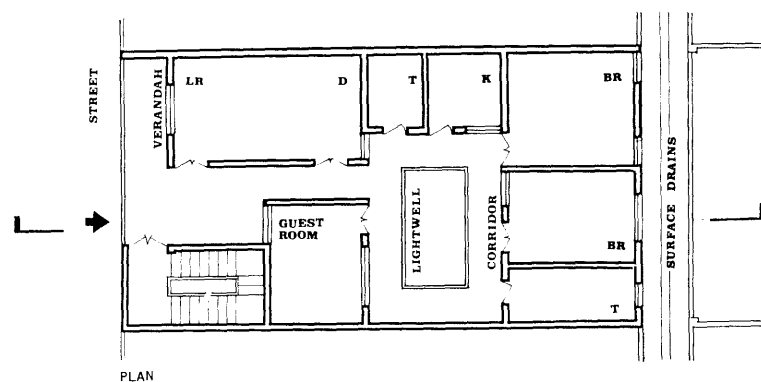
0 1 5 10m

TYPICAL DWELLING
MODIFIED CORE

1:200



SECTION

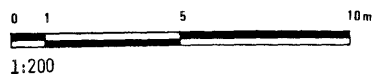


PLAN

KEY

LR Living Room
 D Dining/Eating Area
 BR Bedroom
 K Kitchen/Cooking Area
 T Toilet/Bathroom
 Original Core
 Additions
 Demolitions

TYPICAL DWELLING
NEW



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
 type: APARTMENT
 area (sq m): 116
 tenure: LEGAL, OWNERSHIP/RENTAL
 LAND/LOT
 utilization: PRIVATE
 area (sq m): 116
 tenure: LEGAL, OWNERSHIP
 DWELLING
 location: PERIPHERY
 type: ROW, WALKUP
 number of floors: 4
 utilization: SINGLE, FAMILY
 physical state: GOOD
 DWELLING DEVELOPMENT
 mode: INSTANT
 developer: POPULAR
 builder: ARTISAN, SELF MANAGED
 construction type: MASONRY-CONCRETE
 year of construction: 1979
 MATERIALS
 foundation: MASONRY
 floors: TERRAZZO
 walls: BRICK
 roof: CONCRETE
 DWELLING FACILITIES
 wc: 2
 shower: 2
 kitchen: 1
 rooms: 4
 other: VERANDAH

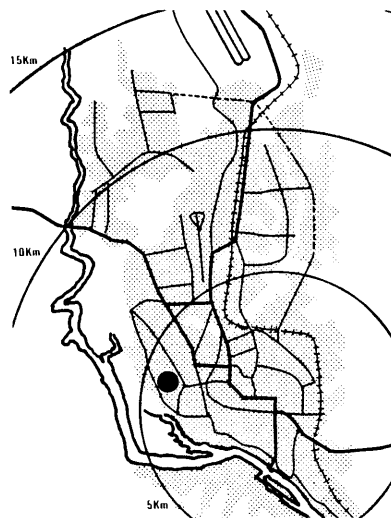
SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
 user's ethnic origin: BENGALI
 place of birth: Dacca
 education level: MASTER'S DEGREE
 NUMBER OF USERS
 married: 2
 single: 1
 children: 4
 total: 7
 MIGRATION PATTERN
 number of moves: 1
 rural - urban: 1
 urban - urban: -
 urban - rural: -
 why came to urban area: EMPLOYMENT
 GENERAL: ECONOMIC
 user's income group: MODERATE
 employment: PUBLIC SERVANT
 distance to work: 7 Km
 mode of travel: OFFICE BUS
 COSTS
 dwelling unit: \$10,000 (1981)
 land - market value: \$10,500 (1981)
 DWELLING UNIT PAYMENTS
 financing: PUBLIC SUBSIDIZED
 rent/mortgage: \$105/MONTH
 % income for rent/mortgage: 31%

2. JHIGATOLA, DACCA

JHIGATOLA: The study area is part of Jhigatola, which in turn is part of the Shipbur-Rayerbazar general area. These areas grew informally over a long period, and its history goes back to at least the 1850's. At that time it was inhabited by a large number of potters, and was mainly a regional center for the manufacture of pottery. This trade is still carried out in some parts of this area by small manufacturers and also on a large scale by a glazed pottery industry. In the beginning Hazaribagh, Jhigatola and Rayerbazar became urbanized as a natural expansion of Dacca along the riverbank. As the river shifted away and as river transport became less important, the focus of urbanization shifted towards the more central areas.

The establishment of a large number of tanneries at Hazaribagh in the 1950's and the development of Dhanmondi (a high-income residential area), adjacent to the area raised the land values and brought employment and improved services. This prompted developments at a large scale in this area. However, the most significant amount of development took place in the late 60's and 70's, especially after the Independence of Bangladesh, when the population pressure and the demand for urban land and services increased manifold. Responding to the informal processes, the original land parcels were divided and subdivided and the area came to accommodate the low and middle income at convenient distances from employment, city services, and the higher-income residential areas. As common in other informal growth areas, it contains a high percentage of small scale commercial and manufacturing establishments.



LOCATION: Jhigatola is located in the western periphery of Dacca, about 4 miles from the "modern" business district by the Burhiganga River. To the west are low areas and the river. These low areas become submerged in the rainy season. To the north is Rayer Bazar, an informal district and to the east is Dhammondi, a high income residential area developed by the government. To the south is Pilkhana, which at present is a military cantonment, and Hazaribagh were a large number of tanneries are located.

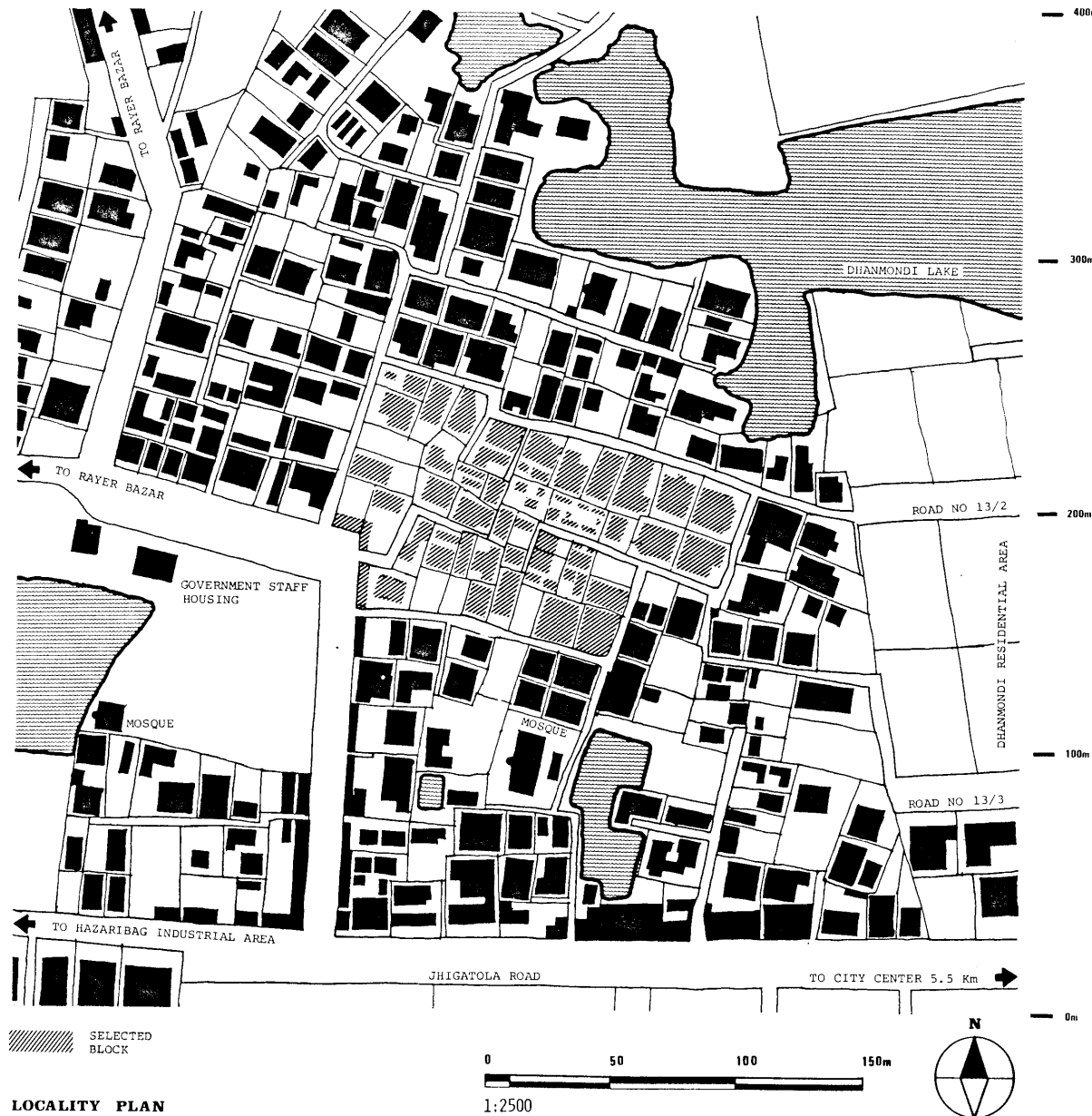
LAYOUT AND CIRCULATION: As the area grew informally and by accretion, different constraints at different times appear to have shaped development in the area. Thus, the typical layout of any part of this area is a geometrically irregular pattern in sharp contrast to the regular layout of the adjacent government developed housing estate. This irregular pattern may have been dictated by the boundaries of land titles or the process of building on available high land and gradually filling in the lower portions as time passed.

Jhigatola, Hazaribagh and Rayer Bazar grew around a central spine which crossed the whole length of the city, following the river bank. Although the importance of this road has decreased in the context of the city, it remains the major street of the area, which links Muhammadpur at one end to the old city at the other, passing through Rayer Bazar, Jhigatola and Hazaribagh. At present, the smaller streets transverse to this main street have become quite important as they connect the area to the

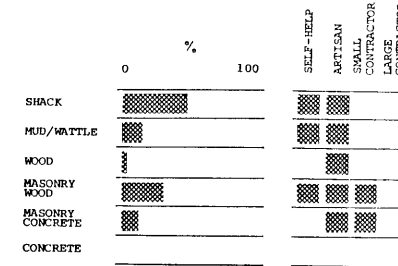
Satmasjid road through which runs the public transportation routes. The roads are narrow, and not suitable for vehicular traffic and therefore, very congested during the day. This factor has kept land prices in the area relatively lower than in the more accessible places in the city. Street widths vary - from about 18m to 60cm for the many alleys. The normal vehicular street is about 3m wide, the vehicles being mainly cycle rickshaws, bicycles and motorbikes. Quite a few bullock carts ply the streets carrying construction materials and bulk goods. Public transportation is composed of the cycle rickshaws and a system of auto tempes plying between the area and other parts of the city.

Block sizes vary and are difficult to identify according to more conventional definitions, as many streets are cul-de-sacs. The usual block size is about 80m x 150m. Lot sizes and shapes also vary, sizes ranging from about 300m² to less than 100 m². Although dwellings are mostly of the detached type in this area, lot coverage is very high and in some cases the buildings cover almost the whole plot. A large percentage of the lots in the area are yet to be built upon or are partly built. The density and percentage of commercial uses are expected to go up considerably at full development.

A considerable part of the area is still a lowland which connects to the Dhanmandi lake on one side and the river on the other. Fingers of this lowland branch off into the built-up areas and form a system of storm drainage. Almost the entire city depends on lowlands for storm drainage. However, these are gradually being filled up.



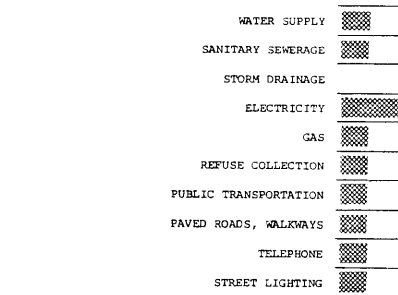
LOCALITY CONSTRUCTION TYPES



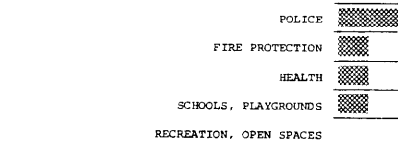
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



LOCALITY COMMUNITY FACILITIES

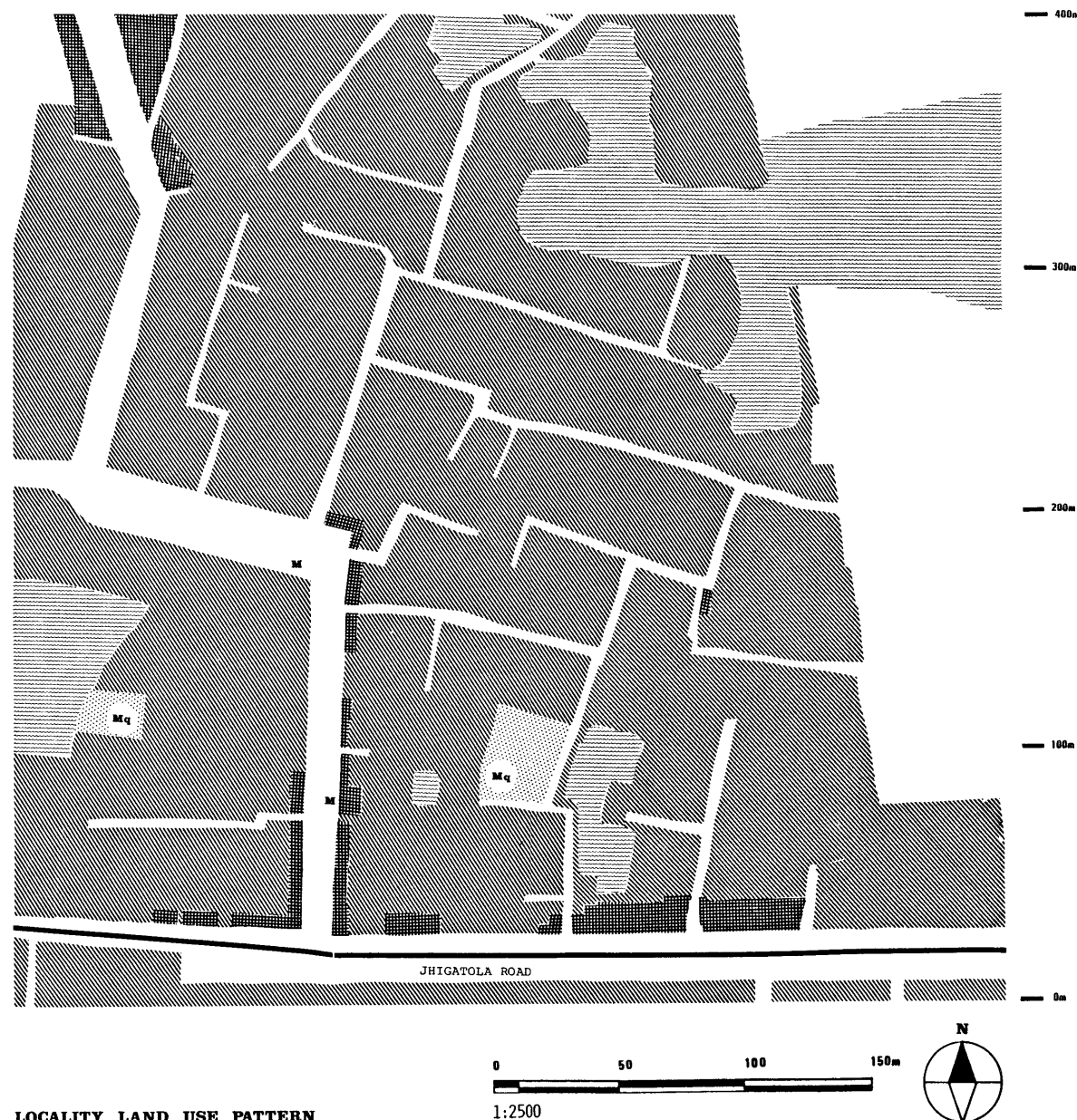


The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

CASE STUDY SOURCES

- Locality Plan: (approximate) Bacca Improvement Trust, ongoing survey map, 1981
- Land Use Pattern: (approximate) Field Survey, author
- Block Plan: (approximate) Field Survey, author 1981 and DIT map, 1981
- Typical Dwellings: (accurate) Field Survey, author, Syed A. Moquit & Salimulla 1981, 1981
- Photographs: Interviews, A.H.M. Mahibullah, Planner, DIT & residents interviews
- Background Information: Interviews, A.H.M. Mahibullah, Planner, DIT & residents interviews



LOCALITY LAND USE PATTERN

LAND USE: Jhigatola is primarily a residential area with commercial activities located along the major pedestrian routes. There are also quite a few small scale manufacturing establishments scattered in the neighborhood. Hazaribagh has a good number of large scale industries, while Rayer Bazar has mostly small scale industries. Taken together, this whole area presents a mixed land use image.

There are almost no public open spaces, except for school playgrounds, even the private areas are densely built. The only community facilities are the mosques, which are scattered throughout, in the interior of the blocks. This may have been the result of ease of access from the neighborhoods, but may also be a conscious effort not to use the commercially valuable street frontage on the wider main roads.

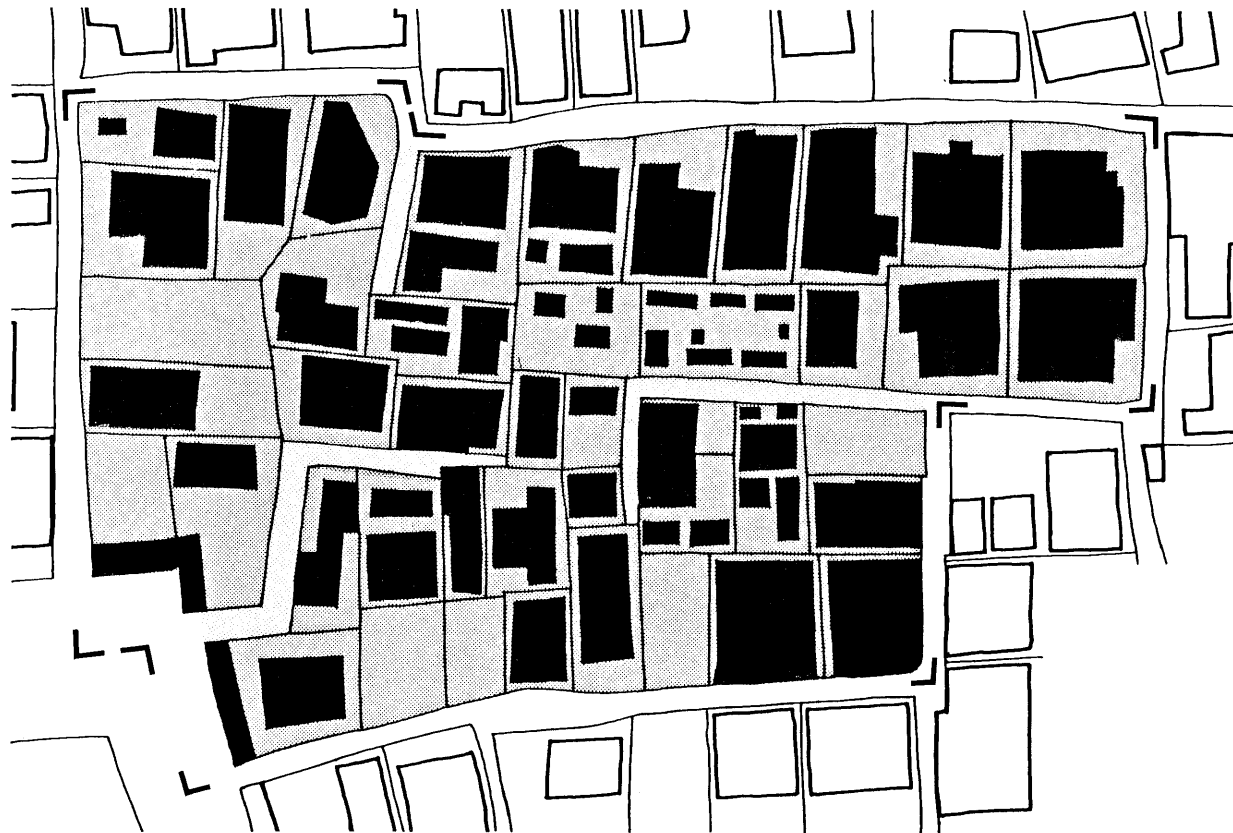
Due to the proximity of the area to the lowlying brickfields to the west which supply bricks to a large part of Dacca, a large number of businesses dealing with construction materials have established themselves in this area.

AREAS

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- OPEN SPACES

KEY

- Mq Mosque
- M Market
- Auto Tempo Service



LOCALITY BLOCK LAND UTILIZATION DATA

| DENSITIES | Total Number | Area Hectares | Density N/Ha |
|----------------|-----------------|------------------|-----------------|
| LOTS | 44 | 1.28 | 34.3 |
| DWELLING UNITS | 102 | 1.28 | 79.7 |
| PEOPLE | 1120 | 1.28 | 875 |

| AREAS | Hectares | Percentages |
|---|----------|-------------|
| PUBLIC (streets, walkways, open spaces) | 0.21 | 16.4 |
| SEMI-PUBLIC (open spaces, schools, community centers) | -- | -- |
| PRIVATE (dwellings, shops, factories, lots) | 1.01 | 78.9 |
| SEMI-PRIVATE (cluster courts) | 0.06 | 4.7 |
| TOTAL | 1.28 | 100.0 |

NETWORK EFFICIENCY

Network length (streets, walkways) = 463 m/Ha
Areas served (total area)

LOTS
Average area, dimensions = 160 m²

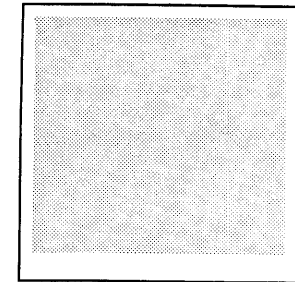
PATTERN

Public: streets/walkways
Semi-Private: cluster courts
Private: lots
dwellings



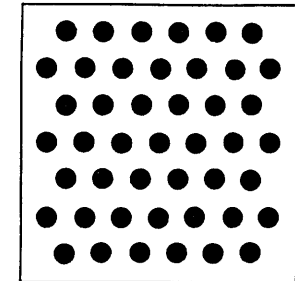
LAND UTILIZATION DIAGRAMS

1 Hectare



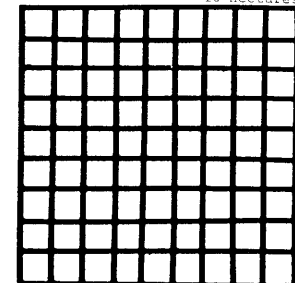
PERCENTAGES Streets/Walkways 16.2
Playgrounds 4.9
Cluster Courts 78.9
Dwellings/Lots

1 Hectare



DENSITY Persons/Hectare 896
● 79 Persons

16 Hectares



CIRCULATION EFFICIENCY

Meters/Hectare 463

LOCALITY BLOCK LAND UTILIZATION

POPULATION: The population, like the land use, presents a mixed character with people from all income groups, from low to high. There is no clear demarcation between these groups, both living side by side. In a general sense, bigger and better houses are located in more advantageous locations. A concentration of the low-income groups can be seen closer to the river bank which is at a lower elevation and in cases subject to monsoon flooding.

Most of the low-income residents are renters, and work in the industries and commercial establishments nearby. At present, there is a growing population of lower-middle and middle-income renters who are employees in government or private organizations. The area is relatively inexpensive and conveniently located near work places.

The gross density is very high, ranging from 450-500 P/Ha in built-up areas. The general average density is lower because of large areas of low swampy unbuilt lands.

DWELLINGS: A range of dwelling types can be identified according to materials used for construction, number of stories and physical types. In general, dwellings are detached, perhaps as a response to the humid tropical climate and also due to the flexibility it gives for independent development. Although detached, they are very dense, more so in the older and more constructed (developed) parts, and the distance between buildings, in cases, is reduced down to 0.5m. The lot coverage also varies, some dwellings being more of a rural nature with a number of one story living units grouped around an open court

and sharing toilets and the court. The more built-up units which are usually older are built in one solid mass almost covering the lot.

The units are generally low-rise walk-ups, ranging from a single story to a maximum of 5 stories. The materials used also vary, permanent materials (masonry and concrete) for the multistory buildings and semi-permanent materials (tin, wood, bamboo) for the single-story buildings. The construction process is generally progressive, except in publicly financed units which tend to be instant, mainly due to the stipulations in the financing agreement. Construction activity is always going on in some part of the area, especially in the dwellings for the lower-incomes. Development irrespective of the income group is carried out by hired masons and help under the supervision of owners and/or relatives.

There is a definite correlation between construction and dwelling types with regard to the following factors:

- 1) The income of the household - The higher incomes generally have multistory units built of permanent materials. The higher incomes usually have better access to public finance and due to its terms and conditions can better utilize public finance.
- 2) The financing source - Units with public subsidized finance have permanent materials, usually multistoried and instant in development. The privately financed units use semipermanent materials, are single story and progressive in development.

SERVICES: Most of the city services are available but of limited provision and poor quality. This includes drinking water (supplied 2-3 times daily) electricity, and street lighting, garbage collection (once or twice in a week, limited only to the main streets), gas (only in some areas), and telephone. Sewage is disposed of in septic tanks, pit latrines or in some cases, directly into the surrounding lowlying areas. Septic tanks and pit latrines are cleared occasionally by a special population category (called *methars*) with the help of small tanks mounted on Bullock carts. The effluent is disposed into the river or in municipal drains.

The ratio of people to the number of latrines is quite high, especially in the lower-income households. In many cases, a number of tenant families shared only one latrine with the owner, children usually defecating out in the streets or in open spaces. Bathing in outdoor open spaces for men and semi-enclosed spaces for women is common in the low-income dwellings. This of course, does not hamper privacy as the area consists of mostly single-story buildings.



SPACE USE: Typical alley, semiprivate use, convenient space for children's play as well as for access to utilities, Rayerbazar (left). Low income dwellings, raising chicken, growing vegetable, drying clothes in the privacy of shared courtyard, Rayerbazar (top). Extension of dwelling and kitchen into small court, Mohammedpur, case study (bottom).



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
 type: HOUSE, JOINT FAMILY
 area (sq m): 64.5
 tenure: LEGAL, OWNERSHIP

LAND/LOT
 utilization: PRIVATE
 area (sq m): 190
 tenure: LEGAL, OWNERSHIP

DWELLING
 location: PERIPHERY
 type: DETACHED
 number of floors: ONE
 utilization: MULTIPLE, FAMILY
 physical state: FAIR

DWELLING DEVELOPMENT
 mode: INCREMENTAL
 developer: POPULAR
 builder: ARTISAN
 construction type: WOOD
 year of construction: SINCE 1965

MATERIALS
 foundation: MASONRY
 floors: CEMENT
 walls: BAMBOO MAT
 roof: CORRUGATED IRON

DWELLING FACILITIES
 wc: 2
 bath: 1
 kitchen: 2
 rooms: 5
 other: VERANDAH, 3SHOPS

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
 user's ethnic origin: BENGALI
 place of birth: MYMENSINGH
 education level: GRADUATE

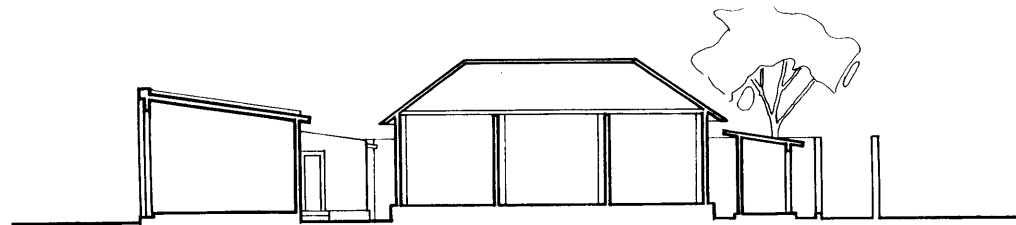
NUMBER OF USERS
 married: 4
 single: 2
 children: 3
 total: 9

MIGRATION PATTERN
 number of moves: 2
 rural - urban: -
 urban - urban: 2
 urban - rural: -
 why came to urban area: WORK

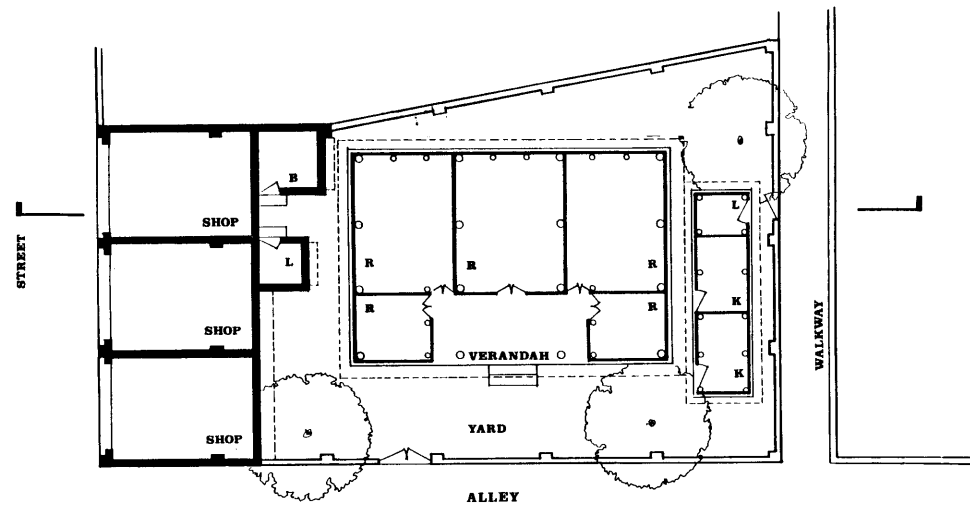
GENERAL: ECONOMIC
 user's income group: MODERATE
 employment: BUSINESS
 distance to work: 4 Km
 mode of travel: RICKSHAW

COSTS
 dwelling unit: \$5,000(1981)
 land - market value: \$15,600(1981)

DWELLING UNIT PAYMENTS
 financing: SELF
 rent/mortgage: -
 % income for rent/mortgage: -



SECTION



PLAN

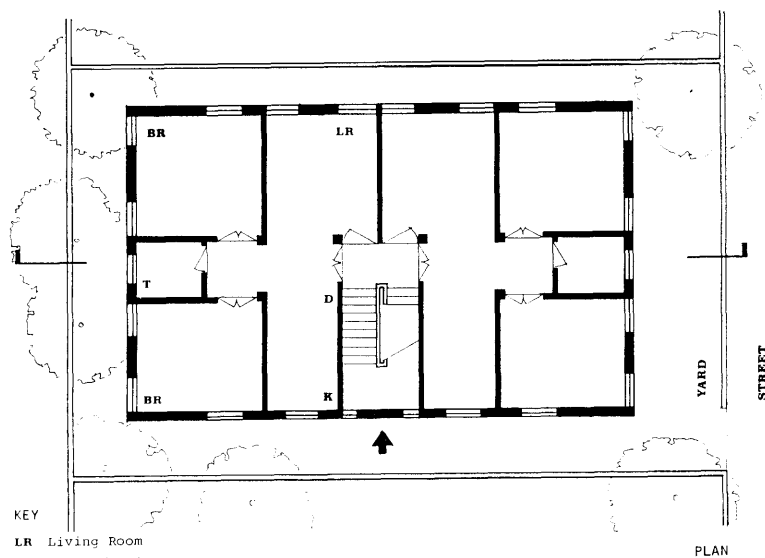
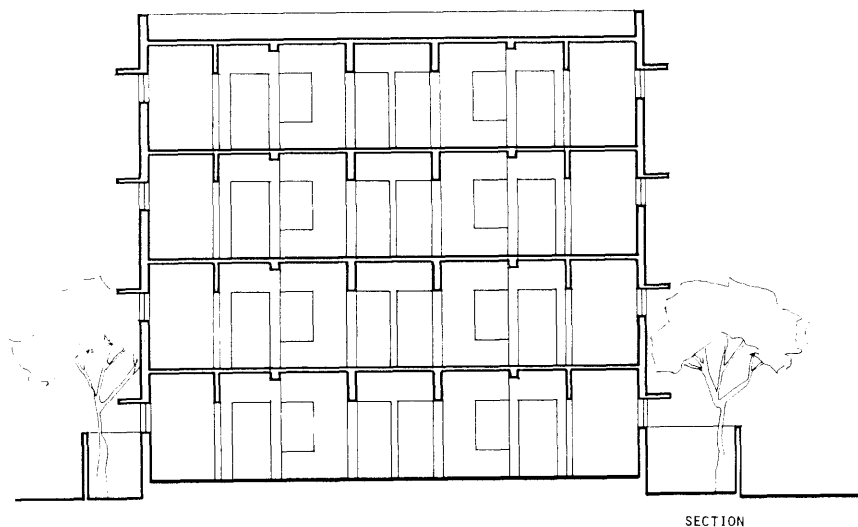
KEY
 K Kitchen/Cooking Area
 L Latrine
 B Bath
 R Room (multi-use)

TYPICAL DWELLING



0 1 5 10m

1:200



KEY

LR Living Room

D Dining/Eating Area

BR Bedroom

K Kitchen/Cooking Area

T Toilet/Bathroom

TYPICAL DWELLING

1:200

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
 type: APARTMENT
 area (sq m): 55
 tenure: LEGAL, OWNERSHIP/RENTAL

LAND/LOT
 utilization: PRIVATE
 area (sq m): 222
 tenure: LEGAL, OWNERSHIP

DWELLING
 location: PERIPHERY
 type: DETACHED, WALKUP
 number of floors: 4
 utilization: SINGLE, FAMILY
 physical state: GOOD

DWELLING DEVELOPMENT
 mode: INSTANT
 developer: POPULAR
 builder: ARTISAN/SMALL CONTRACTOR
 construction type: MASONRY-CONCRETE
 year of construction: 1981

MATERIALS
 foundation: CONCRETE
 floors: CEMENT-TERRAZZO
 walls: BRICK
 roof: CONCRETE

DWELLING FACILITIES

wc: 1
 shower: 1
 kitchen: 1
 rooms: 3
 other: -

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
 user's ethnic origin: BENGALI
 place of birth: DACCA
 education level: GRADUATE

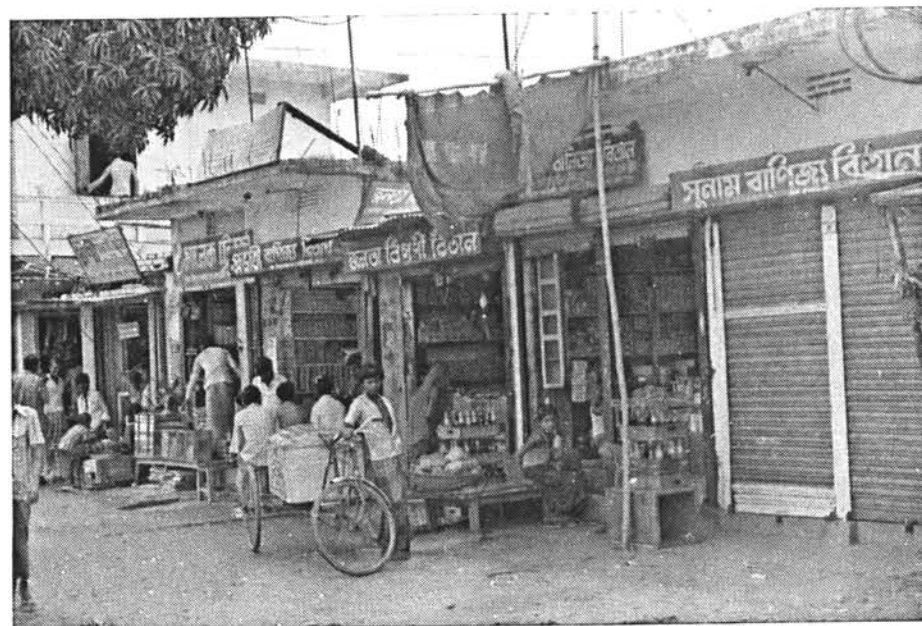
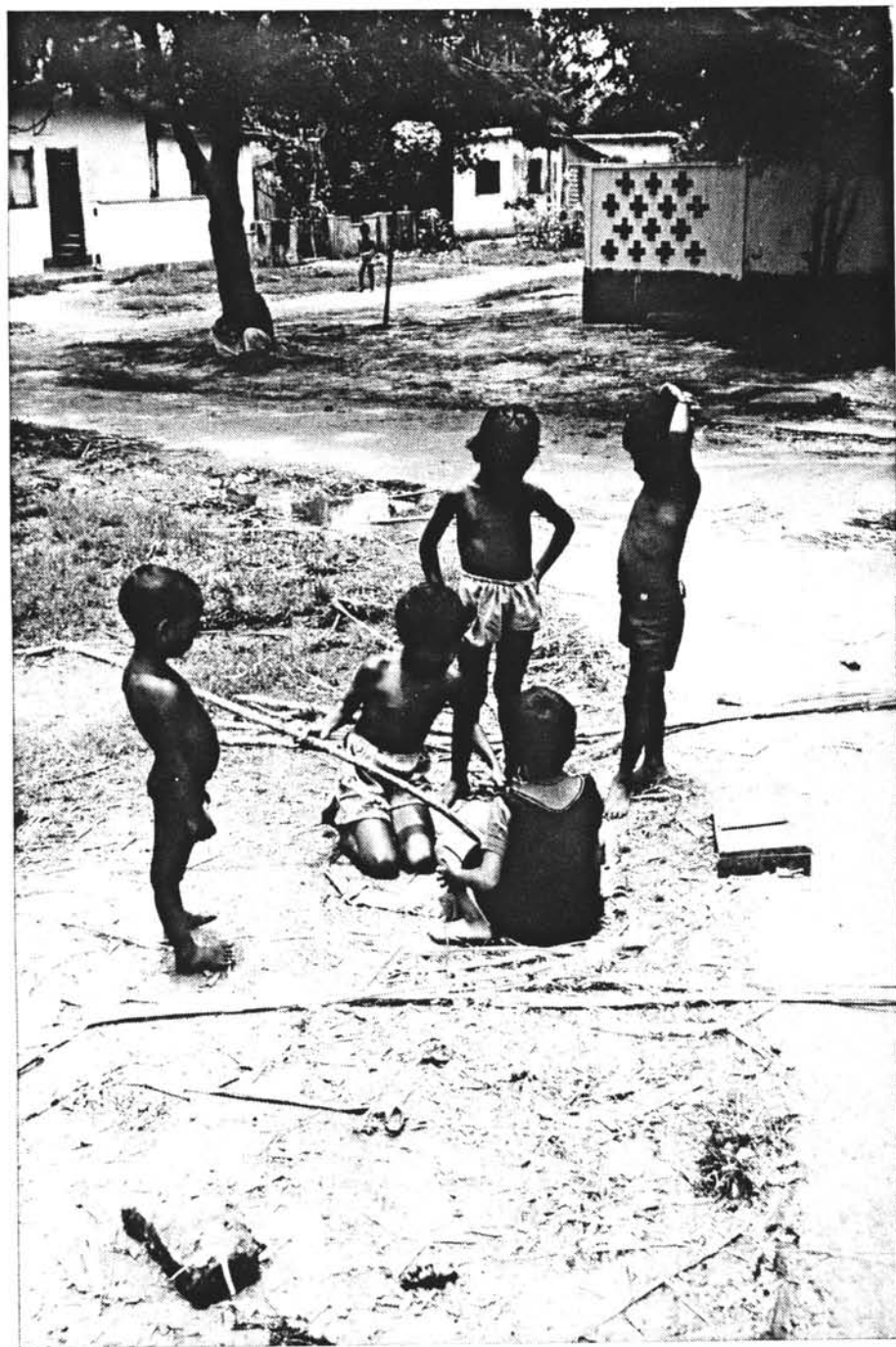
NUMBER OF USERS
 married: 2
 single: 1
 children: 2
 total: 5

MIGRATION PATTERN
 number of moves: 1
 rural - urban: 1
 urban - urban: -
 urban - rural: -
 why came to urban area: EDUCATION/WORK

GENERAL: ECONOMIC
 user's income group: HIGH
 employment: SELF-EMPLOYED
 distance to work: 6 Km
 mode of travel: RICKSHAW

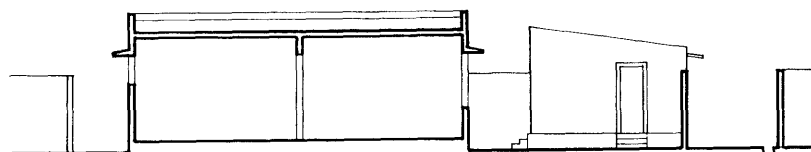
COSTS
 dwelling unit: \$6,000
 land - market value: \$20,000

DWELLING UNIT PAYMENTS
 financing: PUBLIC SUBSIDIZED
 rent/mortgage: \$70/MONTH
 % income for rent/mortgage: 20%

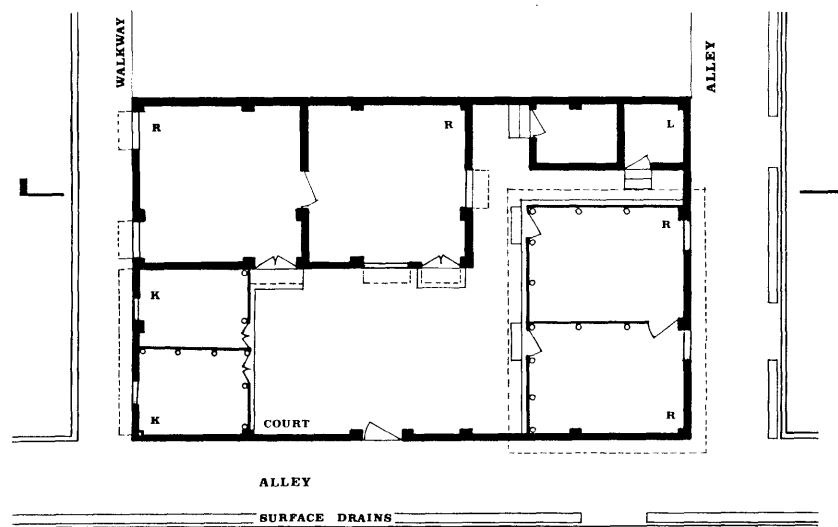


ECONOMIC ACTIVITY: 8 Yr old child selling sugarcane to increase family income, Mirpur (left) Consolidation of informal shopping along street frontages, extended benches foster social exchange and commerce, Raverbazar (top). Room at right rented to shopkeeper in addition to his own shop in the front room permits tailor to send children to school, case study, Moha mmedpur (bottom).





SECTION

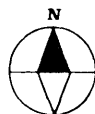


PLAN

KEY

- L Latrine
- B Bath :
- K Kitchen/Cooking Area
- R Room (multi-use)

TYPICAL DWELLING



0 1 5 10m

1:200

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: ROOMS
area (sq m): 32
tenure: LEGAL, RENTAL/OWNERSHIP

LAND/LOT
utilization: PRIVATE
area (sq m): 150
tenure: LEGAL, OWNERSHIP

DWELLING
location: PERIPHERY
type: DETACHED
number of floors: ONE
utilization: SINGLE, FAMILY
physical state: FAIR

DWELLING DEVELOPMENT
mode: INCREMENTAL
developer: POPULAR
builder: ARTISAN
construction type: MASONRY-WOOD
year of construction: 1963 AND ADDITIONS SINCE

MATERIALS
foundation: MASONRY
floors: CEMENT
walls: BRICK, BAMBOO MAT
roof: CORRUGATED IRON

DWELLING FACILITIES
wc: 1
bath: 1
kitchen: 2
rooms: 4
other: -

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: BENGALI
place of birth: WEST BENGAL
education level: HIGH SCHOOL

NUMBER OF USERS
married: 4
single: 2
children: 4
total: 10

MIGRATION PATTERN
number of moves: 2
rural - urban: 1
urban - urban: 1
urban - rural: -
why came to urban area: WORK

GENERAL: ECONOMIC
user's income group: LOW
employment: SERVICE
distance to work: 5 Km
mode of travel: BUS/RICKSHAW

COSTS
dwelling unit: \$3,300
land - market value: \$11,250

DWELLING UNIT PAYMENTS
financing: SELF
rent/mortgage: -
% income for rent/mortgage: -

TABLES

TABLE - I : BANGLADESH: POPULATION GROWTH AND HOUSING

| | URBAN | | | RURAL | | | TOTAL | | |
|--------------------------------------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|
| | 1960 | 1973 | % INCREASE | 1960 | 1973 | % INCREASE | 1960 | 1973 | % INCREASE |
| POPULATION | 2,640,726 | 6,273,603 | 137.57 | 48,199,509 | 65,205,468 | 35.28 | 50,840,235 | 71,479,071 | 40.59 |
| RESIDENTIAL UNITS | 451,901 | 1,036,157 | 129.28 | 9,127,567 | 11,543,287 | 26.46 | 9,579,468 | 12,579,444 | 31.31 |
| PERCENTAGE OF TOTAL | 4.71% | 8.23% | - | 95.28% | 91.76% | - | 100.00% | 100.00% | - |
| OCCUPANCY RATE/UNIT | 5.84 | 6.05 | 3.59 | 5.28 | 5.64 | 6.81 | 5.30 | 5.68 | 7.17 |
| NO. OF PERSONS PER HABITABLE ROOM | - | 4.36 | - | - | 4.26 | - | - | 4.27 | - |

Source: Chaudhary, Rafiqul Huda, URBANIZATION IN BANGLADESH. Centre for Urban Studies, research monograph, 1980

TABLE - II : BANGLADESH: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY NUMBER OF ROOMS

| NO. OF ROOMS | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Av. Rms. /H.H. |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------|
| BANGLADESH | 44.97 | 30.16 | 14.18 | 06.47 | 02.43 | 00.94 | 00.41 | 00.19 | 00.07 | 00.12 | 01.98 |
| RURAL | 44.05 | 30.84 | 14.41 | 06.53 | 02.43 | 00.93 | 00.40 | 00.18 | 00.07 | 00.13 | 01.99 |
| URBAN | 54.91 | 22.77 | 11.75 | 05.82 | 02.41 | 01.05 | 00.45 | 00.33 | 00.13 | 00.33 | 01.87 |
| DACCA | 50.69 | 24.67 | 13.56 | 06.92 | 02.46 | 00.87 | 00.72 | 00.16 | 00.06 | 00.15 | 01.41 |
| KHULNA | 50.53 | 35.68 | 09.22 | 02.91 | 00.93 | 00.39 | 00.15 | 00.10 | 00.03 | 00.08 | 01.71 |
| DINAJPUR | 35.88 | 31.69 | 17.50 | 08.26 | 03.58 | 01.56 | 00.75 | 00.39 | 00.16 | 00.18 | 02.24 |

Source: STATISTICAL YEARBOOK OF BANGLADESH. 1979, Bangladesh Bureau of Statistics.

TABLE III : URBANIZATION BY POPULATION PERCENTAGE

| Census | Urban | Rural | Intercensal | | Rate of Growth (Exponential) | | National (Av) |
|--------|-------|-------|-------------|--------|------------------------------|-------|---------------|
| | | | Urban | Growth | Urban | Rural | |
| 1901 | 2.43 | 97.57 | | | | | |
| 1911 | 2.55 | 97.47 | 14.96 | | 1.39 | 0.85 | 0.87 |
| 1921 | 2.61 | 97.39 | 8.85 | | 0.84 | 0.51 | 0.52 |
| 1931 | 3.01 | 96.99 | 22.20 | | 2.00 | 0.64 | 0.68 |
| 1941 | 3.66 | 96.34 | 43.20 | | 3.59 | 1.58 | 1.65 |
| 1951 | 4.34 | 95.66 | 18.38 | | 1.68 | 0.00 | 0.00 |
| 1961 | 5.19 | 94.81 | 45.11 | | 3.72 | 1.83 | 1.92 |
| 1974 | 8.78 | 91.22 | 137.57 | | 6.70 | 2.33 | 2.62 |
| 1981 | 11.6 | 88.84 | 115.30 | | | | |

Source: Chaudhary, Rafiqul Huda, URBANIZATION IN BANGLADESH. Centre for Urban Studies research monograph, 1980.

TABLE IV : POPULATION GROWTH IN CITIES

| | 1961 | 1974 | % variation over 1961 |
|------------|---------|-----------|-----------------------|
| DACCA | 521,034 | 1,679,672 | 222.4 |
| CHITTAGONG | 364,205 | 889,760 | 144.3 |
| KHULNA | 127,970 | 437,314 | 241.7 |
| RAJSHAHI | 56,885 | 132,909 | 133.7 |

Source: STATISTICAL YEARBOOK OF BANGLADESH. - 1979, Bangladesh Bureau of Statistics.

TABLE - V : AVERAGE FLOOR SPACE PER PERSON BY DIFFERENT INCOME GROUPS (1970).

| | LOW | LOWER MIDDLE | MIDDLE | UPPER MIDDLE | HIGH | AVERAGE |
|--|-------|-----------------|--------|-----------------|-------|---------|
| BANGLADESH (urban, average) | 37.55 | 48.93 | 63.11 | 90.54 | 94.41 | 48.98 |
| DACCA (population 1.2 million) | 32.08 | 43.93 | 57.59 | 86.37 | 77.34 | 47.93 |
| KHULNA (popula- tion 0.4 million) | 29.85 | 49.15 | 43.38 | 103.81 | 58.40 | 46.74 |
| DINAJPUR (popula- tion .06 million) | 43.07 | 56.27 | 68.57 | 62.85 | 73.33 | 52.44 |

Source: ISRT, Dacca University, URBAN HOUSING DEMAND SURVEY, 1974.

TABLE - VI: GROWTH OF POPULATION AND AREA OF DACCA CITY

| Year | Period | Areas in sq. miles | Total Popu- lation |
|------|-----------------|-----------------------|-----------------------|
| 1600 | Pre-Mughal | 1 (sq. mile) | Not known |
| 1700 | Mughal Period | 50 sq. miles | C. 900,000 |
| 1800 | British Period | 8 sq. miles | C. 200,000 |
| 1867 | Do | 8 sq. miles | 51,636 |
| 1872 | Do | 8 sq. miles | 69,212 |
| 1881 | Do | 8 sq. miles | 80,358 |
| 1891 | Do | 8 sq. miles | 83,358 |
| 1901 | Do | 10 sq. miles | 104,385 |
| 1911 | Do | 10 sq. miles | 125,733 |
| 1921 | Do | 12 sq. miles | 137,908 |
| 1931 | Do | 12 sq. miles | 161,922 |
| 1941 | Do | 12 sq. miles | 239,928 |
| 1947 | Pakistan Period | 12 sq. miles | 250,000 |
| 1951 | Do | 15 sq. miles | 338,762 |
| 1961 | Do | 25.5 sq. miles | 556,712 |
| 1974 | Bangladesh | 40 sq. miles | 1,679,572* |
| 1980 | Do | 50 sq. miles | 2,500,000 |

*1,955,951
corrected for
under enumera-
tion.

TABLE -VII:
SAMPLE DENSITIES OF SOME RESIDENTIAL AREAS OF
DACCA: (GROSS)

POPULAR GROWTH AREAS:

| | |
|-------------------------|----------|
| 1. Lalbagh | 568 P/Ha |
| 2. Nimali/Siddiquebazar | 568 P/Ha |
| 3. Narinda | 444 P/Ha |
| 4. Gandaria | 470 P/Ha |
| 5. Islampur | 617 P/Ha |
| 6. Banglabazar | 420 P/Ha |
| 7. Khilgaon | 200 P/Ha |

PLANNED AREAS:

| | |
|----------------|----------|
| 1. Dhanmondi | 125 P/Ha |
| 2. Gulshan | 75 P/Ha |
| 3. Banani | 75 P/Ha |
| 4. Mohammedpur | 200 P/Ha |
| 5. Mirpur | 148 P/Ha |
| 6. Minto Road | 25 P/Ha |
| 7. Motijheel | 200 P/Ha |

TABLE -VIII: HOUSING BY CONSTRUCTION TYPES (Percentage)

| TYPE | BANGLADESH | | | | | |
|----------------|------------|-------|---------|-------|--------|----------|
| | RURAL | URBAN | AVERAGE | DACCA | KHULNA | DINAJPUR |
| PERMANENT | 1.05 | 21.45 | 2.71 | 31.52 | 28.58 | 28.55 |
| SEMI-PERMANENT | 14.90 | 24.32 | 15.68 | 29.83 | 12.14 | 26.20 |
| TEMPORARY | 84.05 | 54.22 | 81.60 | 38.65 | 59.28 | 45.25 |

Permanent - Completely built of concrete and/or masonry.
Semi-Permanent - Mixture of tin, masonry and/or any perishable material.
Temporary - Built of a combination of bamboo, jute sticks, thatch straw or any other perishable materials.

Source: STATISTICAL YEARBOOK OF BANGLADESH. - 1979, Bangladesh Bureau of Statistics.

TABLE - IX : URBAN HOUSING TYPES BY INCOME GROUPS

| | VERY LOW | LOW | MIDDLE | HIGH | VERY HIGH |
|-----------------|----------|-------|--------|-------|-----------|
| PERMANENT | 7.85 | 24.83 | 50.19 | 69.47 | 63.64 |
| SEMI- PERMANENT | 9.35 | 22.47 | 27.41 | 10.53 | 15.15 |
| TEMPORARY | 82.72 | 52.66 | 22.40 | 20.00 | 21.21 |

Source: STATISTICAL YEARBOOK OF BANGLADESH. - 1979, Bangladesh Bureau of Statistics.

TABLE - X : URBAN HOUSING BY TENURE - 1973

| CONSTRUCTION TYPE | PERCENTAGE OF TOTAL URBAN HOUSING | | | PERCENTAGE OF EACH CONSTRUCTION TYPE | | | |
|-------------------|-----------------------------------|--------|-----------|--------------------------------------|--------|-------------|-----|
| | OWNED | RENTED | RENT FREE | OWNED | RENTED | RENT FREE * | |
| PERMANENT | 8.4 | 8.25 | 4.1 | 40.6 | 39.6 | 19.8 | 100 |
| SEMI-PERMANENT | 14.0 | 8.55 | 2.5 | 56.2 | 34.00 | 9.8 | 100 |
| TEMPORARY | 32.5 | 16.10 | 5.5 | 60.0 | 29.71 | 10.2 | 100 |
| | 54.9 | 32.09 | 12.2 | | | | |
| | | 100 | | | | | |

* Rent free - Squatters or other extra legal status not subject to rent or taxation

Source: STATISTICAL YEARBOOK OF BANGLADESH. - 1979, Bangladesh Bureau of Statistics.

TABLE - XI : BANGLADESH - TRENDS OF HOUSING TENURE

| | 1960 | | | 1973 | | |
|------------|-------|--------|-----------|-------|--------|-----------|
| | OWNED | RENTED | RENT FREE | OWNED | RENTED | RENT FREE |
| BANGLADESH | 94.66 | 2.46 | 2.87 | 92.43 | 3.75 | 3.81 |
| RURAL | 96.97 | 0.59 | 2.45 | 95.96 | 1.00 | 3.02 |
| URBAN | 50.42 | 38.62 | 10.95 | 53.89 | 33.66 | 12.44 |

Source: STATISTICAL YEARBOOK OF BANGLADESH. - 1979, Bangladesh Bureau of Statistics.

TABLE - XII :

| Occupation Group | Head of Household | Wife of the Head | Children below 15 |
|----------------------------------|-------------------|------------------|-------------------|
| Transport Worker | 22 | - | 4 |
| Laborer | 15 | 4 | 3 |
| Hotel & Restaurant Personnel | 1 | 2 | 1 |
| Domestic and Personal Services* | 6 | 20 | 2 |
| Skilled and Semi-skilled Laborer | 7 | - | 2 |
| Professional Service | 1 | 1 | - |
| Shopkeeper & Small Business | 22 | 1 | 2 |
| Lower Grade Office Service | 20 | 1 | - |
| Beggar | 0.5 | - | - |
| Other | 5.5 | 1 | 1 |
| Do not work and Unemployed | - | 70 | 85 |

Source: Centre for Urban Studies (CUS): 1975.

*Domestic and personal services include domestic help for others' family, collecting lunch boxes from the house and delivering them to offices, etc. The urban occupational structure offers more limited opportunities to women and children than men. And the most domestics have the lowest status and wage in that structure.

GLOSSARY

BLOCK: a primarily residential area bounded and served by public streets, walkways.

COMMUNITY FACILITY: something that is built/established to serve some community need (school: education; police: order/protection; etc.).

DWELLING: the general, global designation of a building/shelter, containing one or more dwelling units in which people live.

DWELLING BUILDER: four groups are considered:

Self-Help Built: where the dwelling unit is directly built by the user or occupant.

Artisan Built: where the dwelling unit is totally or partially built by a skilled craftsman hired by the user or occupant; payments can be monetary or an exchange of services.

Small Contractor Built: where the dwelling unit is totally built by a small organization hired by the user, occupant, or developer; 'small' contractor is defined by the scale of operations, financially and materially; the scale being limited to the construction of single dwelling units or single complexes.

Large Contractor Built: where the dwelling unit is totally built by a large organization hired by a developer; 'large' contractor is defined by the scale of operations, financially and materially; the scale reflects a more comprehensive and larger size of operations encompassing the building of large quantities of similar units, or a singularly large complex.

DWELLING CONSTRUCTION TYPES: primary dwelling construction types and materials are grouped in the following categories:

Shack

Roof: structure - rods, branches.
infill - thatch, mats, flattened tin cans, plastic or canvas sheets, cardboard and/or scrap wood.

Walls: structure - rods, branches, poles.
infill - thatch, mats, flattened tin cans, plastic or canvas sheets, cardboard, scrap wood, and/or mud.

Floor: structure/infill - compacted earth.

Mud and Wattle

Roof: structure - wattle.
infill - thatch, flattened tin cans, or corrugated iron sheets.

Walls: structure - wattle.
infill - mud.

Floor: structure/infill - compacted earth.

Wood

Roof: structure - wood rafters.
infill - thatch, flattened tin cans, or corrugated iron sheets.

Walls: structure - wood frame.
infill - rough hewn wood planks.

Floor: structure/infill - compacted earth, wood joists, flooring.

Masonry/Wood

Roof: structure - wood rafters.
infill - corrugated iron or asbestos sheets, or terracotta tiles.

Walls: structure/infill - murrum, stone, brick, block or tile masonry without columns.

Floor: structure/infill - poured concrete slab on/off grade, wood joists, flooring.

Masonry/Concrete

Roof: structure/infill - poured reinforced concrete with tar and gravel, or terracotta tiles.

Walls: structure/infill - murrum, stone, brick, block or tile masonry without columns, or with columns for multi-story dwellings.

Floor: structure/infill - poured concrete slab on/off grade.

Concrete

Roof: structure/infill - poured or precast reinforced concrete with tar and gravel, or terracotta tiles.

Walls: structure - poured or precast walls or frame.
infill - metal, wood, masonry, plastic.

Floor: structure/infill - poured or precast concrete slab.

DWELLING DENSITY: the number of dwellings, dwelling units, people or families per unit hectare.

DWELLING DEVELOPER: three sectors are considered in the supply of dwellings:

Popular Sector: the marginal sector with limited or no access to the formal financial, administrative, legal, technical institutions involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the popular sector generally for 'self-use' and sometimes for profit.

Public Sector: the government or non-profit organizations involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the public sector for service (non-profit or subsidized housing).

Private Sector: the individuals, groups or societies who have access to the formal financial, administrative, legal, technical institutions in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the private sector generally for profit.

DWELLING DEVELOPMENT MODE: two modes are considered:

Incremental: the construction of the dwelling and the development of the local infrastructure to modern standards by stages often starting with provisional structures and underdeveloped land. This essentially traditional procedure is generally practiced by squatters with de facto security of tenure and an adequate building site.

Instant: the formal development procedure in which all structures and services are completed before occupation.

DWELLING FINANCING: the process of raising or providing funds.
 Self Financed: provided by own funds
 Private/Public Financed: provided by loan
 Public Subsidized: provided by grant/aid

DWELLING FLOORS: the following number are considered:

One: single story; generally associated with detached, semi-detached and row/grouped dwelling types.
 Two: double story; generally associated with detached, semi-detached and row/grouped dwelling types.
 Three or More: generally associated with walk-up and high rise dwelling types.

DWELLING/LAND SYSTEM: a distinct dwelling environment/housing situation characterized by its users as well as by its physical environment

DWELLING LOCATION: three sectors of the urban area are considered:

City Center: the area located within a walking distance (2.5 km radius) of the commercial center of a city; relatively high residential densities.
 Inner Ring: the area located between the urban periphery and the city center (2.5 to 5 km radius); relatively lower residential densities.
 Periphery: the area located between the rural areas and the urban inner ring (5 or more km radius); relatively low residential densities.

DWELLING PHYSICAL STATE: a qualitative evaluation of the physical condition of the dwelling types: room, apartment, house; (the shanty unit is not evaluated).

Bad: generally poor state of structural stability, weather protection and maintenance.
 Fair: generally acceptable state of structural stability, weather protection and maintenance with some deviation.
 Good: generally acceptable state of structural stability, weather protection and maintenance without deviation.

DWELLING TYPE: the physical arrangement of the dwelling unit:

Detached: individual dwelling unit, separated from others.
 Semi-Detached: two dwelling units sharing a common wall (duplex).
 Row/Grouped: dwelling units grouped together linearly or in clusters.
 Walk-Up: dwelling units grouped in two to five stories with stairs for vertical circulation.
 High Rise: dwelling units grouped in five or more stories with stairs and lifts for vertical circulation.

DWELLING UNIT: a self-contained unit in a dwelling for an individual, a family, or a group.

DWELLING UNIT TYPE: four types of dwelling units are considered:

Room: A SINGLE SPACE usually bounded by partitions and specifically used for living; for example, a living room, a dining room, a bedroom, but not a bath/toilet, kitchen, laundry, or storage room. SEVERAL ROOM UNITS are contained in a building/shelter and share the use of the parcel of land on which they are built (open spaces) as well as common facilities (circulation, toilets, kitchens).

Apartment: A MULTIPLE SPACE (room/set of rooms with bath, kitchen, etc.). SEVERAL APARTMENT UNITS are contained in a building and share the use of the parcel of land on which they are built (open spaces) as well as common facilities (circulation).

House: A MULTIPLE SPACE (room/set set of rooms with or without bath, kitchen, etc.). ONE HOUSE UNIT is contained in a building/shelter and has the private use of the parcel of land on which it is built (open spaces) as well as the facilities available.

Shanty: A SINGLE OR MULTIPLE SPACE (small, crudely built). ONE SHANTY UNIT is contained in a shelter and shares with other shanties the use of the parcel of land on which they are built (open spaces).

DWELLING UNIT AREA: the dwelling unit area (m^2) is the built-up, covered area of a dwelling unit.

DWELLING UNIT COST: the initial amount of money paid for the dwelling unit or the present monetary equivalent for replacing the dwelling unit.

DWELLING UTILIZATION: the utilization indicates the type of use with respect to the number of inhabitants/families.

Single: an individual or a family inhabiting a dwelling.

Multiple: a group of individuals or families inhabiting a dwelling.

LAND UTILIZATION: a qualification of the land around a dwelling in relation to user, physical controls, and responsibility.

Private: (dwellings, lots)

User: owner/tenant/squatter

Physical Controls: complete

Responsibility: user

Semi-Private: (cluster courts)

User: a group of owners and/or tenants

Physical Controls: partial/complete

Responsibility: users

Semi-Public: (open spaces, playgrounds, schools)

User: a limited group of people

Physical Controls: partial/complete

Responsibility: public sector, users

Public: (streets, walkways, open spaces)

User: anyone/unlimited

Physical Controls: minimum

Responsibility: public sector

LAND UTILIZATION: PHYSICAL CONTROLS: the physical/legal means or methods of directing, regulating and co-ordinating the use and maintenance of land by the owners/users.

LAND UTILIZATION: RESPONSIBILITY: the quality/state of being morally/legally responsible for the use and maintenance of land by the owners/users.

LAND VALUE: refers to: 1) the present monetary equivalent to replace the land; 2) the present tax based value of the land; or 3) the present commercial market value of the land.

LOCALITY: a relatively self-contained residential area/community/neighborhood/settlement within an urban area which may contain one or more dwelling/land systems.

LOCALITY SEGMENT: a 400 meter by 400 meter area taken from and representing the residential character and layout of a locality.

PERCENT RENT/MORTGAGE: the fraction of income allocated for dwelling rental or dwelling mortgage payments; expressed as a percentage of total family income.

SUBSISTENCE INCOME: average amount of money required for the purchase of food and fuel for an average family of 5 people to survive.

TENURE: two situations of tenure of the dwelling units and/or the lot/land are considered:

Legal: having formal status derived from law.
Extralegal: not regulated or sanctioned by law.

Three types of tenure are generally considered:

Rental: where the users pay a fee (daily, weekly, monthly) for the use of the dwelling unit and/or the lot/land.

Lease: where the users pay a fee for long term use (generally for a year) for a dwelling unit and/or the lot/land from the owner (an individual, a public agency, or a private organization).

Ownership: where the users hold in freehold the dwelling unit and/or the lot/land which the unit occupies.

URBAN CONTEXT: an urban area/environment within which dwelling/land systems develop.

USER INCOME GROUP: based upon the subsistence (minimum wage) income per year, five income groups are distinguished:

Very Low: (below subsistence level) the group with no household income available for housing, services, or transportation.

Low: (at subsistence level) the group that can afford limited subsidized housing.

Moderate: the group that has access to public/private commercial housing (rental).

Middle: the group that has access to private commercial housing (ownership).

High: the most economically mobile sector of the population.

UTILITY/SERVICE: the organization and/or infrastructure for meeting the general need (as for water supply, wastewater removal, electricity, etc.) in the public interest.

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